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The Marine Shells of the West Coast of North America

VOL. II

PART II

BY

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PREFACE TO PART II

Volume II contains the Marine Gastropods and is in three parts, of which this is the second, to be followed immediately by the third and last part.

Many of the plates here used are from the *Proceedings* and *Bulletins* of the United States National Museum. In some cases species for comparison from Lower California and south of there are included on the plates, but are not described in the text.

The United States National Museum had photographs made of some of the unfigured species to use in the plates. The American Museum of Natural History, New York City, also had photographs made of some of the type figures. Many of the figures in *Bulletin 112* and in some of the *Proceedings* have been refigured for use in making up the plates.

The line or lines preceding the description of a shell in the text give the reference to the original description and figure.

Acknowledgments are given in the Preface to Part I.

I. S. Oldroyd

April 5, 1927

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RANGE OF SPECIES

RANGE TO PANAMA

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Coralliophila costata
Epitonium hexigonum
Simnia variabilis
Cymatium gibbosum
Potamides sculptum
Vermicularia eburnea
Aletes centiquadrus
Turritella nodulosa

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Trivia radians
Trivia sanguinea
Potamides sculptum
Aletes squamigerus

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Murex gemma
Murex santarosanus
Murex festivus
Purpura nuttallii
Purpura *v.* aciculiger
Purpura *v.* albescens
Tritonalia gracillima
Tritonalia *v.* obesa
Tritonalia fusconotata
Tritonalia poulsoni
Tritonalia *v.* citrica
Tritonalia michaeli
Trophon pacifica
Trophon tenuisculptus
Trophon tripherus
Thais lima
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Acanthina *v.* punctulata
Acanthina paucilirata
Acanthina lugubris
Forreria belcheri
Epitonium evictum
Epitonium crenimarginatum
Epitonium retiporosum
Epitonium crebricostatum
Epitonium tiara
Epitonium columbianum
Epitonium californicum
Epitonium diegense
Janthina globosa
Janthina exigua
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Melanella thersites
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Pyramidella mexicana
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Turbonilla buttoni
Turbonilla jewetti
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Turbonilla auricoma
Turbonilla heterolopha
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Odostomia fetella
Odostomia tenuisculpta
Odostomia minutissima
Simnia acicularis
Simnia barbarensis
Simnia uniplicata
Trivia sanguinea
Bursa californica
Cymatium tremperi
Trifora peninsularis
Cerithiopsis oxys
Cerithiopsis pedroana
Cerithiopsis diomedae
Cerithiopsis cosmia
Seila montereyensis
Alabina tenuisculpta
Syncera translucens
Bittium johnstonae
Bittium *v.* montereyense
Bittium serra
Bittium oldroydi
Potamides cyclus
Trichotropis kelseyi

Micranellum crebricinctum
Fartulum hemphilli
Elephantulum carpenteri
Vermiculum anellum
Turritella jewetti
Tachyrhynchus lacteolus
Tachyrhynchus pratomus
Littorina planaxis
Littorina scutulata
Lacuna unifasciata
Lacuna *v.* aurantiaca
Iselica fenestrata
Litiopa bombyx
Alaba jeanettae
Barleeia haliotiphila
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Epitonium greenlandicum
Trichotropis conica
Trichotropis costellata
Turritellopsis stimpsoni
Tachyrhynchus erosus
Tachyrhynchus reticulatus
Littorina grönlandica
Littorina rudis
Lacuna glacialis
Lacuna divaricata
Lacuna solidula
Aquilonaria turneri

RANGE TO JAPAN

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Trophon multicostata
Thais lima
Argobuccinum oregonense
Trichotropis insignis

LIST OF FAMILIES IN PART II

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Epitoniidae
Janthinidae
Melanellidae
Pyramidellidae
Pterotracheidae
Carinariidae
Atlantidae
Ovulidae
Cypraeidae
Triviidae
Pediculariidae
Ranellidae
Cymatiidae
Seguenziidae
Triforidae
Cerithiopsidae
Cerithiidae
Trichotropidae
Caecidae
Vermetidae
Turritellidae
Littorinidae
Lacunidae
Fossaridae
Litiopidae
Rissoidae
Rissoinidae
Anaplocamidae
Truncatellidae

PART II. CLASS GASTROPODA *(Continued)*

Family MURICIDAE

Genus **MUREX** Linnaeus, 1758

Testa univalvis, spiralis, exasperata suturis membranaceis. Apertura desinens in canalem integrum rectum s. subadscendentem. (Linnaeus.)

Shell ovate or oblong; spire prominent; whorls convex, crossed by three or more continuous varices; aperture ending below in a canal, which is generally partly closed. (Tryon, *Structural and Systematic Conchology.*)

Type. *Murex tenuispina* Lamarck.

Distribution. World-wide, mostly tropical and subtropical; low water to fifty fathoms or more.

Subgenus Alipurpura Bayle, 1884

Murex rhyssa Dall, 1919

Plate 30, fig. 1

Proceedings of the United States National Museum, **56**:332.

Shell elongate, trialate, white, with a rasp-like surface, a dark brown nucleus of two whorls, and five subsequent whorls, with a narrow shoulder in front of an obscure appressed suture; axial sculpture beside the three varices and the minute imbricate surface includes a nodulous rib between each pair of varices; the latter are slightly recurved with a prominent spinosity at the shoulder, about six major, the same number of minor, and numerous smaller imbricate intercalary riblets in the last varix, which extends to the end of the long closed canal; aperture ovate, white, simple, entire; operculum normal, brown. Height of shell, 62; of last whorl, 47; of aperture, 12; maximum diameter, including the varix, 27 mm. (Dall.)

Type in United States National Museum, No. 160500. Type locality, San Pedro, California.

Range. Santa Barbara Islands, California, to Ballenas Lagoon, Lower California.

Murex erinaceoides Valenciennes, 1832

Humboldt and Bonpland, *Observations zoologiques,* **2**: 302.

Testa ovata-fusiformi, transversim, sulcata, varicosa; rufa anfractibus subrotundis impressis, ultimo longiori. (Valenciennes.)

Shell ovate-fusiform, transversely sulcate, varicose; reddish; with impressed subrotund whorls, the last the longest. (Translation.)

Remarks: Ce petit *Murex d'Acapulco* ressemble beaucoup au *Murex erinaceus* que l'on trouve en grande abondance dans la Mediterranee. Mais quelque grande que soit leur resemblance, je ne puis pas regarder le *Murex de l'Ocean Pacifique* comme étant de la meme espèce que celui des mere d'Europe. Voici la description comparée que je soumets aux conchyologistes et les différences spécifique qui me paroissent exister entre ces deux coquilles. Les tours de spire du Rocher érinaceoide sont plus distincts, la rampe de la spire étant plus enfoncée; le dernier tour est plus haut et plus large. Les bourrelete sont moins saillans; l'ouverture est un peu plus ouverte, le canal est plus droit. La couleur de ce *Murex americain* est rousse et brillante; le diaphragme du syphon est blanc ainsi que l'intérieur de la bouche. La hauteur des individus que j'ai examines est d'un pouce et quelques lignes. (Valenciennes. Original from Humboldt and Bonpland, p. 302, New York Public Library.)

Type locality, Acapulco, Mexico.

Range. San Diego, California, to Panama.

Murex trialatus Sowerby, 1841

Proceedings, Zoölogical Society of London, 143. *Conchological Illustrations,* Murex; fig. 18.

"Mur." testa rhomboidea, laevi, subventricosa, fulva, fusco-nigrescente fasciata; varicibus tribus, alatis; ad marginem undatis, postice subelongatis, subaculeatis, ad latus marginale fimbriatis, subcanaliculatis, a tergo laevibus, ad terminum exfoliatis; apertura ovali; labio undato; cauda brevi, lata; canali clauso; spira elongata. (Sowerby.)

Light yellow, usually banded with a darker color. The want of a tooth on the lip, the usually smaller size, and the strong development of the single node between the varices suffice to distinguish it from *M. foliatus.* Length, 2.5–3.25 in. (Tryon, *Manual of Conchology.*)

Type in Museum Saul. Type locality not known.

Range. Bodega Bay, California, to Todos Santos Bay, Lower California.

Subgenus Pteropurpura Jousseaume, 1880

Murex carpenteri Dall, 1899

See Part I, Plate 28, fig. 9

Nautilus, **12**:138. *Proceedings of the United States National Museum,* **24**; Pl. 34, fig. 9, 1902.

Shell trilate, reddish-brown, with obscure spiral lines of darker brown, the aperture whitish with a darker throat; nucleus brownish, whorls about eight, the last much the largest; suture distinct, appressed, intervarical surface smooth or obscurely spirally striate, the apical whorls with recticulate threading; the last two or three whorls with a single obscure nodulosity on the periphery between the varices; varices continuous up the spire; posterior face of the varices smooth with obscure radial ridges which slightly crenulate the margin, in adolescent shells; but in full-grown ones there are about five rather wide, low radial ridges, each of which terminates in a digitation of the margin; anterior face of the varices with profuse, close-set, crenulate imbrications, which in fully grown shells show radial depressions corresponding to the ridges on the back of the varix; digitations excavated in a shallow manner anteriorly, terminating in somewhat blunt projections, thin and sharp-edged; aperture small, oval, with a continuous, raised, smooth margin without denticulations; canal closed, moderately wide, bent to the right in front, a disused smaller canal bordering its posterior two-thirds on the left. Length of shell, 57; of last whorl from the suture, 42; width, including varices, 35; width of aperture, 9.5; length of aperture, 13 mm. (Dall.)

TYPE in United States National Museum. Type locality, Monterey, California.

RANGE. Point Conception to San Diego, California.

Murex carpenteri tremperi Hemphill, 1911

Transactions of the San Diego Society of Natural History, 1:99; Pl. 1, figs. 1, 1*a*.

Shell similar to *M. carpenteri,* about typical in form and coloring, with the addition of three white revolving bands, that expand, in width as they pass toward the outer edge of the foliated varices, and show on three of the spire whorls. There are three broad, thin varices on the specimen before me, the edge of the last broken by five, rather broad, circular indentations, separated by four, broad, rather short, chisel-shaped digitations, curved upward at the ends. The somewhat large basal indentation forms about two-thirds of a regular circle, is one-fourth of an inch across, its edge thickened and regularly reflexed, except next to the long, curved, and well-covered canal. The body and varices are quite smooth, except the last varix, which is roughened on the lower side by wavy, file-like striae. (Hemphill.)

TYPE in Tremper Collection, Los Angeles. Type locality, off Newport, California.

RANGE. Newport Bay and San Pedro, California, in 35 fathoms.

Murex petri Dall, 1900

See Part I, Plate 28, fig. 7

Nautilus, **14**:37. *Proceedings of the United States National Museum,* **24**; Pl. 34, fig. 7, 1902.

Shell solid, when perfect, with an acute produced apex of four or five whorls, followed by four ordinary whorls; nepionic shell with convex shouldered whorls with up to six rounded varices, spirally sculptured, with rather prominent threads; color of the shell, purplish-brown more or less minutely mottled or articulated with paler spots; surface with obsolete flattish spiral threads stronger on the backs of the varices, and, when perfect, also showing very minute spiral striation; whorls between the varices with a single not very prominent knob; varices flattish, with five or six projecting points or digitations separated by shallow emarginations and slightly excavated on the forward face; these projections are not recurved; anterior face of the varices covered with profuse, crinkled, imbricating lamellae; a marked sulcus between the anterior digitation and the canal; aperture ovate, thickened, with a projecting yellowish margin without any dentiform process; the interior shows about six nodular denticles on the anterior two-thirds of the outer lip; canal closed, rather long, sharply curved to the right. Long. of shell, 65; lat., 32; of aperture, 15.6; lat., 11.5 mm. (Dall.)

TYPE in United States National Museum. Type locality, San Pedro, California, in deep water.

RANGE. Santa Barbara to San Pedro, California.

Subgenus TRIREMIS Bayle, 1884

Murex santarosanus Dall, 1905

Plate 32, fig. 3

Nautilus, **19**:14.

Shell small for the subgenus, with about six whorls, each bearing from five to seven, strong, low reflexed varices, with a prominent, short, reflexed and inflexed grooved spine at the shoulder of the whorl; nuclear whorls one and a half, smooth, minute; nepionic whorls two and a half, with whorls tabulate, two strong spiral cords at the shoulder, the varices thin, irregular laminae low and obscure; subsequent whorls, with five (increasing in the adult to seven), strong, anteriorly crispate, amber-brown varices, under which the whorls are tabulate, the intervening spaces whitish, nearly smooth or with very obscure revolving lines or threads; base of the whorls somewhat constricted, with a short grooved spine on each varix where it crosses the concavity; aperture ovate, small, with the inner lip smooth, the outer one more or less denticulate on the edge, the enamel whitish; canal long anteriorly attenuated, the margins adjacent but not adherent. Height of adult, 45.0; max. diam., 28.0; min. diam., 10.5 mm. (Dall.)

TYPES in United States National Museum, Nos. 130628 and 133945. Type locality, off Santa Rosa Island, California, in 82 fathoms.

RANGE. Santa Barbara Islands, California, to Cerros Island, Lower California.

Murex gemma Sowerby, 1879

Thesaurus Conchyliorum, Murex, 32; Pl. 22, fig. 214.

Testa pyriformis laevis solida alba, superne nigro bifasciata, infra super liras nigro lineatis; vericibus quinis crassis, spiraliter prominente liratis, ad angulum tuberculatis, ad medium anfractus precedentis superne elevatis, spira conica, anfractibus ad suturam inter varices profundissime cavernosis, infra medium excavatis; apertura ovata, margine tenui canali breviusculo, clauso, superne lato.—This exquisite shell, although closely connected with the group by the deep excavation of the whorls between the varices at the suture, and by general form, has no fronds, but raised ridges across the thick varices, which are painted with reddish black. (Sowerby.)

Length, 1.25 to 1.5 in. (Tryon, *Manual of Conchology.*)

TYPE in British Museum? Type locality ?

RANGE. Santa Barbara, California, to Cerros Island, Lower California.

Murex festivus Hinds, 1843

Zoölogy of the Voyage of H.M.S. Sulphur, Molluscae, **9**; Pl. 3, figs. 13, 14.

Testa fusiformi, crassa, fulva, trivericosa; varicibus simplicibus, recurvis, superne cristatis, subtilissime creniferis; interstitiis nodulosis, lineis subgeminis transversis fuscis eleganter ornatis; apertura ovali; labro intus sparsim denticulato; canali valde clauso, ad basin subrecurvo. (Hinds.)

Whitish, closely encircled by incised lines, which are brown, varices reflexed, widely laminar, crossed by close rows of elegant semicircular scales. Length, 1.5–2.5 in. (Tryon, *Manual of Conchology.*)

Not known where the type is. Type locality, Magdalena Bay, Lower California.

RANGE. Santa Barbara, California, to Cerros Island, Lower California.

Genus **PURPURA** Martyn, 1784

Shell triangular, varices wing-like; aperture elongate-ovate. Canal moderately long, usually closed in adult specimens; outer lip with a produced tooth near the base. (Tryon, *Manual of Conchology.*)

This is the description of the subgenus *Cerostoma* (Conrad). *Purpura* Martyn is the first binominal use of the name, used by the ancients colloquially to indicate the muricoid shells from which the Tyrian purple was derived. In harmony with this tradition it is applied by Martyn to a shell which Linnaeus would have called *Murex,* and which has been usually known as *Cerostoma foliatum* Martyn, after Carpenter. This is Martyn's only species of *Purpura* in Volumes I and II, and hence the type. In 1798 Bolten adopted the same view, and began his list of *Purpuras* with the group of *Murex trunculus.* There seems to be no doubt that, if any of Martyn's names are valid, *Purpura foliata* must typify the group bearing the ancient designation. (Dall.)

TYPE. *Purpura foliata* Martyn, 1784.

DISTRIBUTION. North Pacific, Japan, Bering Straits.

Purpura foliata Martyn, 1784

Figures of Nondescript Shells; Table 2, Pl. 66.

Shell ovately oblong, spire rather short; whorls transversely ribbed, ribs small, compressed, somewhat distant, interstices smooth; three-varicose, varices thin, erectly foliated, whitish, banded with chestnut-brown; aperture small, columella lip simple, outer lip denticulated, armed at the lower part with a small flattened tooth; canal short, flatly compressed, closed. (*Conchologica Iconica.*)

Length, 85; diameter, 45 mm. (Oldroyd.)

TYPE in Museum White. Type locality, Sitka, Alaska.

RANGE. Sitka, Alaska, to San Diego, California.

Purpura nuttallii Conrad, 1837

Journal of the Philadelphia Academy of Natural Sciences, 7:264; Pl. 20, fig. 22.

Shell fusiform, whorls with three prominent obtuse varices, carinated on the back, and lamellar at base; aperture elliptical; submargin of the labrum toothed; channel of the beak concealed; color brown, with a white band on each whorl; within, white. (Conrad.)

Length, 1.5–2 in. (Tryon, *Manual of Conchology.*)

TYPE in Philadelphia Academy of Sciences. Type locality, Santa Barbara, California.

RANGE. Monterey, California, to Scammons Lagoon, Lower California.

Purpura nuttallii albescens Dall, 1919

Proceedings of the United States National Museum, **56**:332.

Completely white or yellowish-white. (Dall.)

Type in United States National Museum, No. 252894. Type locality, San Pedro, California.

Range. San Pedro, California, to San Quentin Bay, Lower California.

Purpura nuttallii albofasciata Dall, 1919

Proceedings of the United States National Museum, **56**:332.

Shell generally preserving the usual brownish color, has a broad white band, making it very conspicuous, about the middle of the shell, and one on the canal. (Dall.)

Type in United States National Museum, No. 181827. Type locality, San Diego, California.

Range. San Pedro to San Diego, California.

Purpura nuttallii aciculiger Valenciennes, 1846

Plate 30, figs. 12, 12*a,* 12*b*

Voyage de la Frégate Venus, Atlas; Pl. 10, fig. 1.

Shell differs in that the shell is smaller, varices are thick and rounded, while in the typical form the varices are thin and erectly foliated. Both have the same color forms. (Oldroyd.)

Measurements of *P. nuttallii* are length, 64; width, 35 mm. Of *P. aciculger,* length, 45; width, 24 mm. (Oldroyd.)

Range. San Pedro, California, to Scammons Lagoon, Lower California.

Genus **TRITONALIA** Fleming, 1828

Spire elevated; varices numerous, rounded, sometimes raised; canal generally closed. (H. and A. Adams.) (*Ocinebra* Leach, 1847.)

Type. *Murex erinaceus* Linnaeus.

Distribution. West coast of America, Alaska, to Gulf of California.

Tritonalia gracillima Stearns, 1871

Conchological Memoranda, Part VI:1. *American Journal of Conchology,* **7**:172; Pl. 14, fig. 15.

Shell small, solid, ovately fusiform, rather slender; spire elevated, subacute; whorl six–seven; body whorl about two-thirds of the length of the shell; upper portion of whorls more or less angulated; aperture ovate, about the same length as the spire; outer lip thickened, internally white, with four prominent denticles; columellar lip somewhat excavated, incrusted, with a purplish stain showing through the enamel; canal closed, moderately recurved; surface covered with a slight yellowish epidermis and numerous revolving costae of a whitish hue, finely dotted with reddish-brown, and the intercostal sulcations near the edge of the outer lip with linear markings of the same color (one specimen shows brownish blotches upon the middle of the body whorl.) This shell is also longitudinally nodosely ribbed, the ribs decreasing in prominence as the whorls enlarge. Length, .50; width, .25 in. (R. E. C. Stearns.)

TYPE in United States National Museum. Type locality, San Diego, California.

RANGE. Monterey, California, to San Geronimo Island, Lower California.

Tritonalia gracillima obesa (Stearns MS.) Dall, 1919

Proceedings of the United States National Museum, **56**:333.

Shell resembling *T. gracillima* in most respects but notably wider. The coloration is yellowish, with brown flecks, especially on the prominences. The canal closed. The aperture is bluish-white, with four strong denticles on the anterior two-thirds of the inner lip. Height of shell, 19; of aperture and canal, 8; diameter, 7.5 mm. (Dall.)

TYPE in United States National Museum, No. 228722. Type locality, Laguna Beach, California.

RANGE. Monterey, California, to Gulf of California.

Tritonalia lurida Middendorff, 1849

Beitrage zu einer Malacologia Rossica, 150; Pl. 4, figs. 4, 5.

Testa minuta lurida, crassa; ovato-conica; anfractibus convexis, longitudine aequaliter ac confertissime strio-costulatis; costulis rotundato-carinatis prominentibus, incrementi vestigiis imbricato-scabratis; columella crassa labioque et tota apertura lacteis, vernicosis; labro crenulato, ad marginem acuto, tenui, interiora versus mox incrassato, aperturam angustante, granulorum (5 ad 6) serie denticulato; canali subclauso. (Middendorff.)

Die Rippenstreifen verlaufen ganz gleichmässig neben einander bis auf den Kanal hinab; durch quer über dieselben hinlaufenden Zuwachslamellen erhalten sie ein feilenartig rauhes Aeussere die dieselben von einander trennenden Furchen sind sehr schmal, weniger denn halb so breit als die Rippenstreifen selbst, schneiden jedoch tief ein und werden im

Gründe durch die Zuwachslamellen in Fächerchen abgetheilt. Das eine der Examplare zeigt Andeutungen zu sanftwelligen Querfalten der Windungen des Gewindes. Der Kanal wird durch eine Lamelle verlegt, welche von der Spindel her sich über denselben lagert, und den Kanal fast völlig verdeckt. Die Substanz der Schale selbst ist weiss, und letstere erhält ihre Farbe allein von der braungelben Aussenschichte her. Long., 18; lat., 9; alt., 11; lat. aperture, 5 mm. (Middendorff.)

Shell of medium size, fusiform; whorls six, convex, slightly angulated near posterior margin; upper whorls with several transverse ridges; surface ornamented with numerous rounded, raised lines; suture deeply impressed, distinct; body-whorl not extraordinarily ventricose; aperture subovate; outer lip thickened, denticulated; inner lip incrusted; columella widened; umbilicus subperforate; canal narrow, sometimes covered with overgrowing lips. (Arnold.)

TYPE in Academy of St. Petersburg. Type locality, Sitka, Alaska.

RANGE. Sitka, Alaska, to Santa Barbara, California. Fossil: Pleistocene—San Pedro, San Diego, California.

Tritonalia lurida aspera Baird, 1863

Plate 32, fig. 1

Proceedings, Zoölogical Society of London, 72.

Vit. testa fusiformi, purpurea, scabra, elongata, longitudinaliter plicato-costata, transversim lirata, liris crebris et minutissime squamatis; anfractibus sex, ultimo trientes duos longitudinis testae adequante, in canalem rectum, longiusculum, apertum, desinente; columella planulata, fauce albida; labro externo intus dentato, extus serrato; operculo oblongo, nucleo in margine externo sito. Long., 1; lat., ½ in. (Baird.)

Vit. with fusiform shell, purplish, rough, elongate, longitudinally plicate-costate, transversely lirate, with the ribs frequently and minutely scaly; with six whorls, the last equaling two-thirds of the length of the shell, ending in a straight, longish, open canal; columella flattened, with white cheek; outer lip dentate within, serrated without; operculum oblong, with nucleus situated on the external margin. (Translation.)

TYPE in British Museum. Type locality, Esquimalt Harbor, Vancouver Island, British Columbia.

RANGE. Sitka, Alaska, to San Pedro, California.

Tritonalia lurida rotunda Dall, 1919

Proceedings of the United States National Museum, **56**:333.

Shell small, short, much inflated, solid, with four or more whorls, the apex eroded; suture appressed, obscure; axial sculpture incremental, irregular, sometimes rising to lamellae, forming pits in the interspaces of the spiral sculpture; the latter comprises (on the penultimate whorl, 5 or 6; on the last whorl, about 14) strong, elevated, blackish-brown, more or less undulated and transversely striated squarish ribs with narrower interspaces, covering the whole whorl; aperture ovate, purplish when fresh, fading to light pink in the cabinet; outer lip strong, crenate by the sculpture, internally thickened, and with six prominent denticles; inner lip erased, pillar short; canal very short, but distinctly recurved. Height of shell, 16.5; of aperture, 12.5; diameter, 13 mm. (Dall.)

TYPE in United States National Museum, No. 208495. Type locality, Moss Beach, Halfmoon Bay, California.

RANGE. Moss Beach to San Luis Obispo, California.

Tritonalia lurida munda Carpenter, 1864

Supplementary Report, British Association for the Advancement of Science, 663. *Proceedings of the United States National Museum,* **15**; Pl. 20, fig. 3, 1892.

In a starved condition, it is a narrow, small form. Tall with faint sculpture. (Carpenter.)

RANGE. Middleton Island, Alaska, to San Diego, California.

Tritonalia squamulifera Carpenter, 1868

Gabb, *Paleontology of California,* **2**:44.

T. satis turrita, pallide rufofusca; anfr. nucl. ? norm. iv tabulatis, tumentioribus, suturis ad angulum 80°–100° acute impressis; costis rad. vii–xxvii vix varicosis, angustis, ad angulum posticum interdum spinosis, ad basim continuis; liris spiralibus primum iii fenestratis dein creberrimis, asperis, squamulatis, interstitiis angustis, plus minusve incisis, canali longiore, rectiore, duabus trientibus aperturae aequante, vix aperta; apertura ovali, labro incrassato, intus circ. v dentati; labio laevi, crassiore. Long., .9; long, spir., .35; lat., .51 poll. (Carpenter.)

With the general aspect of *T. tenuisculptus,* it is at once recognized by the difference in sculpture. The fossil (unique) specimen is much finer than the immature living one sent by Dr. Cooper. In this the varices are not spinous at the angle, and the spiral sculpture is stronger. (Gabb.)

TYPE in Philadelphia Academy? Type locality, Catalina Island, California.

RANGE. Santa Barbara to San Pedro, California. Fossil: Post-Pliocene —Santa Barbara, California.

Tritonalia fusconotata Dall, 1919

Proceedings of the United States National Museum, **56**:333.

Shell solid, light yellow-brown, with spiral bands of dark brown spots between the ribs, usually one at the periphery and another at each end of the whorl, but sometimes missing; whorls four or five exclusive of the (lost) nucleus, rather inflated; suture distinct, constricted, the whorl in front of it appressed and gathered into short, minute, vertical wrinkles; axial sculpture otherwise of six or seven prominent vertical ribs extending across the whorls and rather sharp elevated incremental lines; spiral sculpture of (on the last whorl, about 24) subequal spiral cords with narrower channeled interspaces, covering the whorl; aperture rather wide, white; outer lip somewhat expanded, internally denticulate; body and pillar erased; canal short, closed in the adult, with a marked siphonal fasciole. Height of shell, 26; of last whorl, 20; diameter, 15 mm. (Dall.)

TYPE in United States National Museum, No. 46729. Type locality, Monterey, California.

RANGE. Monterey to Catalina Island, California.

Tritonalia poulsoni Carpenter, 1865

Journal de Conchyliologie, series 3, **5**: 148. Tryon, *Manual of Conchology,* **1**: Pl. 38, fig. 475.

O. t. turrita, solida, lueto-albida, rufo-sanguineo spiraliter lineata; vertice nucleoso parvo, laevi, parum tumente; t. juniore rhomboidea, haud varicosa, spira planata, peripheria subangulata, canali recta, longiore, labro intus dentato labio distincto, subcalloso; t. adulta, anfr. 7 primis planatis, posticis tumidis; suturis planatis, sedarea postica concava; costis subvaricosis crebris, lumentibus, irregularibus, anfractu ultimo 7, circiter quinquies subnodosis; tota superficie spiraliter crebre insculpta; sulcis punctatis, rufo-sanguineis; apertura ovali; labro acutiore, dorsaliter tumido, varicoso, intus dentibus validis circiter 6 munito; labio solido, sub suturam dente valido parietali munito, super columellam calloso; canali breviore, aperto. Long., 1.85; long. spir., .96; lat., .93 poll. (Carpenter.)

Shell of medium size, elongate-fusiform; spire elevated, compact; whorls six, deeply concave above, convex below, with rounded transverse ridges rising to prominent nodes on the angle of lower part of whorl; nuclear whorls coarsely cancellated; ridges obsolete on concave portion of whorl; more or less prominent spiral ridges on lower portion of whorl; spiral sculpture faint on the concave surface; fine incremental lines quite prominent; suture not deeply appressed, wavy; aperture semi-elliptical; outer lip denticulated; inner lip effuse, incrusted, smooth; canal short, narrow; columella slightly twisted, widened; umbilicus subperforate. (Arnold.)

Type in British Museum? Type locality, San Diego, California.

Range. Santa Barbara, California, to Magdalena Bay, Lower California. Fossil: Pleistocene—Ventura, San Pedro, San Diego, California.

Tritonalia painei Dall, 1903

Plate 32, fig. 7

Proceedings of the Biological Society of Washington, **16**:174.

Shell small, rotund, whitish, with five or six whorls; nucleus small, smooth, polished; subsequent whorls strongly sculptured; axial sculpture of numerous (on the penultimate whorl, 15) sharp, longitudinally wrinkled varices extending from the suture to the canal with wider interspaces and somewhat angular or spinose at the shoulder of the whorl; these varices are usually confluent at the suture with those of the preceding and following whorl; spiral sculpture of strong elevated rounded threads, with a smaller thread in the interspaces, somewhat crenulating but not overriding the varices; aperture ovate, the peristome thin, simple, continuous, projecting; there are no lirations in the aperture, the siphonal fasciole is well marked, the canal short and closed over in front of the aperture, with no discarded cana-spines. Length, 15; length of last whorl, 11; maximum diameter, 8 mm. (Dall.)

Type in United States National Museum, No. 109306. Type locality, off Catalina Island, California.

Range. Dundas Bay, Alaska, to San Diego, California.

Tritonalia circumtexta Stearns, 1871

Conchological Memoranda, Part VI: 1. *American Journal of Conchology,* 7; Pl. 14, fig. 14.

Shell ovate, solid, sub-turreted, of five convex whorls. Upper whorls cancellated; body whorl transversed by about 14 roughly-rounded revolving costae, more or less tuberculated at the intersection of the longitudinal ribs, and marked with fine incremental striae. Last whorl, three-fourths the length of the shell; outer lip thickened, internally denticulate, external edge crenulated. Columella excavated, light purple or purplish-brown; canal short, open or closed in specimens of equal size. Umbilicus obsolete; surface of whorls with faint irregular longitudinal costae. Color dingy white, with two interrupted black or dark-brown bands. Long., .85; lat., .5 in. (Stearns.)

Type in United States National Museum. Type locality, Monterey, California.

Range. Trinidad to San Pedro, California.

Tritonalia circumtexta citrica Dall, 1919

Proceedings of the United States National Museum, **56**:334.

This is a variety which, when fresh, presents a ground color of lemon or orange-yellow instead of the usual grayish-white, while the brown bands are much less emphatic and the shells are usually smaller than those of the type. (Dall.)

Type in United States National Museum, No. 56747. Type locality, Catalina Island, California.

Range. Santa Barbara Islands to Scammons Lagoon, Lower California.

Tritonalia interfossa Carpenter, 1864

Plate 30, fig. 2

Proceedings, Philadelphia Academy of Natural Sciences, **64.** Tryon, *Manual of Conchology,* **2**; Pl. 39, fig. 484.

Shell narrower and more shouldered than *T. lurida,* the lattice of revolving larae and longitudinal ribs coarser and more elevated; canal short, closed. Length, .4 to .75 in. (Tryon, *Manual of Conchology.*)

Range. Sitka, Alaska, to California.

Tritonalia interfossa clathrata (Stearns) Dall, 1919

Proceedings of the United States National Museum, **56**:334.

This is a short and stout form with very prominent rectangular clathration and flatly turreted spire, which was distinguished by Dr. R. E. Stearns in manuscript many years ago but never published. (Dall.)

Type in United States National Museum, No. 177995. Type locality, Avalon, Catalina Island.

Range. Monterey to Catalina Island, California.

Tritonalia interfossa minor Dall, 1919

Proceedings of the United States National Museum, **56**:334.

This is a pale, dwarf, slender form, also from Catalina Island, which seems nevertheless to have reached maturity. It is strongly clathrate. Height, 7; diameter, 3.5 mm. (Dall.)

Type in United States National Museum, No. 56912. Type locality, Catalina Island, California.

Range. Known only from type locality.

Tritonalia interfossa atropurpurea Dall, 1919

Proceedings of the United States National Museum, **56**:334.

This form resembles *clathrata,* but is more elongate and much less distinctly turreted. The color when fresh is a purplish black, which, however, fades in the cabinet to a more or less ruddy brown after some years. It was discriminated in manuscript half a century ago by Dr. P. P. Carpenter, and has been sent out by that name to collectors, but so far as I know has not yet been published. Height, 19; diameter, 7 mm. (Dall.)

TYPE in United States National Museum, No. 155286. Type locality, Neah Bay, Washington.

RANGE. Neah Bay, Washington, to San Diego, California.

Tritonalia interfossa beta (Carpenter) Dall, 1919

Proceedings of the Biological Society of Washington, **32**:250.

Shell resembling *T. barbarensis* Gabb but stouter and without the recurved spines at the shoulders; reddish-brown, of more than five whorls, the nucleus defective, the whorls somewhat turreted by an angular shoulder; axial sculpture of (on the last whorl, six, including the terminal varix; on the penultimate whorl, seven) angular ribs, prominent at the shoulder and extending to the canal; these are crossed by about fourteen densely imbricate spiral cords, subequal and equally spaced, with narrow interspaces; terminal varix heavy. Aperture small, the margin continuous, the outer lip with four or five low denticles internally, the pillar smooth, the canal closed, rather short. Height, 22; of last whorl, 16; diameter, 10 mm. (Dall.)

TYPE in United States National Museum, No. 46728. Type locality, Monterey, California.

RANGE. Known only from type locality.

Tritonalia foveolata Hinds, 1843

Proceedings, Zoölogical Society of London, 127. *Zoölogy of the Voyage of H.M.S. Sulphur, Molluscae;* Pl. 3, figs. 15, 16.

Testa fusiformi, crassa multivaricosa, transversim creberrime sulcata, laminis minimis longitudinalibus foveolata, atro-purpureo pallide bifasciata; varicibus septenis simplicibus, postice rotundatis, antice margine acuta; apertura ovali, coarctata; labro intus obtuse denticulato; labro interno producto; canali aperto, subrecurve. (Hinds.)

Shell of medium size, fusiform; spire elevated; whorls six, angulated, with six or seven prominent, rounded, transverse ribs that rise to the prominence of nodes on the angle of the whorl; surface ornamented with numerous clear-cut, rather squarish, raised lines, and incremental lirulae in the interspaces; suture deeply appressed, wavy; aperture subpyriform; outer lip thickened, denticulated; inner lip incrusted, smooth; canal long, narrow, slightly curved; columella not perceptibly widened; umbilicus subperforate. Long., 33; lat., 17; body-whorl, 28; aperture including canal, 20; canal, 9 mm. (Arnold.)

Type locality, Magdalena Bay, Lower California.

RANGE. Monterey to San Diego, California. Fossil: Pleistocene—Santa Barbara, San Pedro, California.

Tritonalia stearnsi Hemphill, 1911

Transactions of the San Diego Society of Natural History, **7**:100.

The general outline of this small shell is diamond shaped, with the side points rounded off. It is composed of six turns or whorls. The nucleus or embryonic whorls are white, rather rough, and consist of about two turns. The next whorl has flat sides and a square-edged shoulder and is divided by a small revolving groove into two revolving nodulous riblets with shallow pits in the interstices. The antepenultimate and penultimate whorls are convex in form and divided into three revolving nodulous riblets by two revolving grooves, with deep rounded pits in the interstices. The convex body-whorl comprises nearly two-thirds the entire length of the shell with similar sculpturing as that of the two preceding whorls, and with the pits more conspicuous above than below the periphery of the body-whorl. The suture is distinct and well-impressed. The outer lip is very much thickened for such a small shell, its outer edge being faintly denticulated by the revolving ribs and grooves, the inner edge just within the aperture bearing five denticles. The form of the aperture is oval, slightly pointed below; canal short and covered. The base of the columella is creased by an umbilical slit. The color is light or dark yellow or brownish, plain or with a single, white, revolving band at the periphery of the body-whorl, covering one and sometimes two of the revolving riblets. Length, 18; breadth, 8 mm. (Hemphill.)

TYPE in Hemphill Collection, Stanford University, No. 375. Type locality, Monterey, California.

RANGE. Known only from type locality.

Tritonalia sclera Dall, 1919

Proceedings of the United States National Museum, **56**:334.

Shell of moderate size, yellowish, flushed with more or less dark brown, with six well-rounded whorls exclusive of the (lost) nucleus;

suture obscure, undulated; axial sculpture of (on the last whorl, 8; on the penultimate, 10) low, inconspicuous, rounded ribs extending more or less distinctly to the canal with continually wider interspaces; also low sharp incremental lines minutely imbricating the whole sculpture; spiral sculpture of (on the penultimate whorl, about seven; on the last whorl, about twenty-five) strong prominent cords with wider interspaces usually showing an intercalary thread which on the last whorl becomes nearly as strong as the others; aperture rounded, outer lip simple, periodically varicose; body erased, pillar straight; canal distinct, open, narrow, slightly recurved. Height of shell, 29; of last whorl, 21.5; of aperture and canal, 15; diameter, 16 mm. (Dall.)

Type in United States National Museum, No. 222569. Type locality, near Port Townsend, Washington, in 20 fathoms.

Range. Coast of Washington to Venice, California.

Tritonalia subangulata Stearns, 1873

Conchological Memoranda, Part XII, 5; Pl. 1, fig. 4.

Shell small, abbreviated fusiform, dingy white and marked spirally by an inconspicuous band formed of three reddish-brown lines more or less interrupted on the basal and the preceding volution; whorls five, angulated above and on the basal whorl rounded below the angle, with a shallow sulcation beneath; surface covered with rounded and irregular costae, which are inconspicuous or obsolete on the upper whorls; longitudinally marked with from seven to nine irregular rounded ribs, which at the edge of the angle (which is somewhat carinated) are broken into angular or pointed knobs or blunt spines; aperture ovate, angulated above and white within; the outer lip with five or six tubercles internally; canal moderately prolonged, slightly curved and open in the two specimens before me. Length, .89; lat., .41 inch. (Stearns.)

Type in United States National Museum. Type locality, San Miguel Island, California.

Range. Monterey to Santa Barbara Islands, California.

Tritonalia michaeli Ford, 1888

Proceedings, Philadelphia Academy of Natural Sciences, 1888, p. 188.

Shell fusiform, rather slender, turreted, light gray, with a narrow median brown band; whorls five, convex, shouldered above, the upper ones carinate; sculptured with numerous rather coarse revolving lirations, the interstices with riblets bearing crowded festooned lamellae of growth, which are also prominent below the suture; longitudinally prominently plicate, with about seven folds to each whorl; aperture oval, white within, angular above; anterior canal quite long, open, straight; outer lip thickened within, bearing six small tubercules; columella nearly straight; with a whitish callus projecting slightly at beginning of canal. Length of shell, 16; diameter, 8; length of aperture, 9 mm. (Ford.)

Type in Philadelphia Academy of Natural Sciences? Type locality, Cayucos, San Luis Obispo, California.

Range. Orcas Island, Washington, to Gulf of California.

Tritonalia fraseri I. Oldroyd, 1920

Plate 30, figs. 11, 11*a*

Nautilus, **33**:136; Pl. 4, figs. 1, 2.

Shell of medium size, very elongate, narrow; whorls including the nucleus, which is present on nearly all the specimens collected, suture distinct and deep, whorls strongly shouldered, with six strong ribs spinose at the shoulder; body whorl with nine strong spiral cords and with incremental ones between. The shoulder is very strongly rugose, and has from one to two spiral cords, the second whorl has four strong spiral cords and three incremental ones; the third has three strong spiral cords and no incremental ones; aperture elongate-oval, interior yellowish to purple-brown, columella thickened and nearly straight, canal long, straight, and closed in the adult. It differs from the typical form in the very elongate form and the absence of the basket-like sculpture; in some specimens on the fifth and sixth whorls the basket sculpture shows faintly. Length of shell, 20; of aperture, 10; breadth, 9 mm. (Oldroyd.)

Type in Oldroyd Collection, Stanford University. Type locality, Brandon Island, Departure Bay, Vancouver Island.

Range. Known only from type locality.

Tritonalia barbarensis Gabb, 1866

Plate 30, fig. 5

Proceedings of the California Academy of Sciences, **3**:183.

M. t. unicolor, fusca; varicibus v–ix, haud magnis as angulum auctis; varix ultima praelata; anfractu, primo laevi, anfractibus v supra recte truncatis, infra parum convexis; tota superficie liris spiralibus et squamosis induta; apertura subelliptica, intus lactea; labio incrassato, polito; labro extante, tuberculis intus ornata; canali interdum recto, interdum recurvato. Long., .77; lat., .46; long. aper., .2; long. canal, .24 poll.

Shell small, brown; whorls six, the first smooth, the remainder angulated, horizontally or a little concavely truncated above and very slightly convex below the angle; varices variable, from five to nine, usually about six or seven to a whorl, angular but not very prominent, except on the angle, where they are sometimes prolonged into long recurved processes, in other cases only making a prominent angular tubercle; the whole surface is covered with strong revolving ribs, crossed by fine squamose plates; aperture subelliptical, lips prominent, white within, the outer lip with five or six tubercles internally, last varix forming a broad lateral expansion to the lip; canal closed, straight, or more usually a little recurved. (Gabb.)

Length, 20 mm. (Oldroyd.)

Type in Survey Cabinet, Mollusca, Nos. 515 *b, c,* and *d.* Type locality, Catalina Island, California, in 40 fathoms.

Range. British Columbia to Catalina Island, California.

Described as *Murex barbarensis.*

Tritonalia epiphanea Dall, 1919

Proceedings of the United States National Museum, **56**:335.

Shell small, dark brown, acute, with an angular shoulder, slender, with six whorls exclusive of the (lost) nucleus; suture distinct slightly wrinkled and more or less appressed; spiral sculpture of (on the penultimate whorl, six above and seven below the shoulder) strong equal threads with narrower interspaces, the whole slightly imbricated and covering the entire surface in a regular manner; axial sculpture of (on the last whorl, seven) strong rounded ribs most prominent at the shoulder and with much wider interspaces, the spire deeply constricted at the suture; aperture oval, the outer lip thickened but not reflected, internally white with six equal and equally spaced denticulations, the body and arcuate short pillar with a layer of white enamel; the canal long, closed near the aperture, with a narrow fasciole and slightly recurved. Height of shell, 25; of last whorl, 18; of aperture and canal, 13; diameter, 11 mm. (Dall.)

Type in United States National Museum, No. 216809. Type locality, San Pedro, California.

Range. San Pedro and Catalina Island, California.

Tritonalia tracheia Dall, 1919

Proceedings of the United States National Museum, **56**:335.

Shell small, solid, rough, of a greenish-gray color, of about five strongly shouldered whorls, the nucleus lost; the suture obscure, not appressed; axial sculpture of (on the penultimate whorl nine, on the last whorl six or seven) strong ribs, subspinose at the shoulder, and extending to the base; beside these there are rude incremental lines; spiral sculpture on the spire of two strong cords at the periphery, nodulous where they cross the ribs; on the last whorl below the periphery there are three strong cords with narrower deep interspaces, then a wider gap and two more on the canal; aperture subcircular, dark green, with an entire simple margin, the operculum muricoid; canal short, solidly closed, straight, with an imbricate siphonal fasciole. Height of shell, 11.5; of last whorl, 8; diameter, 8 mm. (Dall.)

Type in United States National Museum, No. 207084. Type locality, Sitka, Alaska, in 15 fathoms.

Range. Known only from type locality.

Genus **UROSALPINX** Stimpson, 1865

Shell elongated oval, or short fusiform, longitudinally ribbed or undulated and spirally striated; aperture with a short canal; outer lip dentate and lirate within. Operculum somewhat like that of *Purpura,* semicordate, with the nucleus at the outer edge a little below the middle. (Tryon, *Structural and Systematic Conchology.*)

Type. *Urosalpinx floridana* Conrad.

Distribution. Atlantic coast of America, Cape Horn, Cape of Good Hope, New Zealand, and introduced on the California coast.

Urosalpinx cinereus Say, 1822

Journal of the Philadelphia Academy of Natural Sciences, 2:236. *American Conchology,* 3; Pl. 20, 1831.

Shell with a cinereous epidermis, reddish-brown beneath; volutions cancellate, the transverse costa eleven, robust; revolving lines filiform, irregularly alternately smaller, crenating the edge of the exterior lip, which is acute, and alternating with raised lines of the fauces; fauces tinged with chocolate color; beak short, obtuse, not rectilinear; fabrum not incrassated. Length, 1¼ in. (Say.)

Type in Philadelphia Academy of Natural Sciences. Type locality, Atlantic.

Range. San Francisco Bay to San Pedro, California, introduced with seed oysters from the Atlantic.

Described as *Fusus cinereus.*

Genus **EUPLEURA** H. and A. Adams, 1853

Spire moderate; front canal long, nearly closed; no posterior canal; inner lip smooth; varices spiny, fimbriated between the spines. (H. and A. Adams.)

Type. *Eupleura caudata* Say.

Distribution. Atlantic coast of United States, West Indies, Panama, and California.

Eupleura grippi Dall, 1911

Plate 32, fig. 6

Nautilus, **25**: 87.

Nucleus small, of a single whorl or slightly more, dark chestnut-brown in color, smooth and slightly tilted, followed by four and a half subsequent whorls, with the inception of which the sculpture changes abruptly; the first has two, the second three, the third four spiral threads between the periphery and the subsequent suture; the two original threads stronger than the others, but all becoming relatively feebler, and on the last whorl obsolete; the posterior slope of the whorls is smooth except for lines of growth; on the last whorl there are very obscure indications of obsolete spiral sculpture; the whorls have, in the type specimen, about five obscure nodes at the shoulder, reminiscent of the varices of the other species of the genus; whorls increasing in size rapidly, the shoulder slope flattish, situated at the posterior third on the last whorl, the suture distinct, but not appressed; aperture ovate, the body with a light glaze, the outer lip thickened, sharp-edged, tinged with orange color; the type has eight small denticles within on the callus; canal short, open, slightly recurved; general tint of the type specimen dark, livid, olive color; operculum muricoid. Height of shell, 21.5; of last whorl, 18.0; of aperture, excluding the canal, 10.0; diameter, 11.0; of aperture, 6.2 mm. (Dall.)

TYPE in United States National Museum. Type locality, off San Diego, California.

RANGE. Known only from type locality.

Genus **TROPHON** Montfort, 1810

Shell rather strong, fusiform, spire produced, whorls rough, with lamellar varices, their interstices often lirally sulcated; mouth produced below into a narrow canal; no teeth or plaits on pillar lip. Operculum corneous, unguicular; its nucleus terminal. The species are inhabitants chiefly of deepish water, and for the most part belong to Arctic and boreal seas. (Forbes and Hanley.)

TYPE. *Trophon clathratus* Linnaeus.

DISTRIBUTION. Mostly cold seas; typically, Arctic and Anarctic.

Subgenus AUSTROTROPHON Dall, 1903

Trophon triangulatus Carpenter, 1864

Plate 34, figs. 6, 7

Proceedings of the California Academy of Sciences, 3:224. *Proceedings of the United States National Museum,* **14**; Pl. 5, figs. 1, 3, 6, 1891.

T. t. parva, tenui albida, postice lata, antice attenuata; anfr. nucl. ii. minutis, laevibus, attenuatis, vertice declivi, celato; norm. (t. adolescente)

iv. subtriangulatis, postice tabulatis, axi fere rectangulatis; suturis acute impressis; antice rapidissime angulatis, canali longa, arcuata; varicibus circ. vii. laminalis, arcuatis, ad angulum in spinam compressis, spinis radiantibus, parum superne arcuatis; linea seu angulo obsoleto peripheriali, suturam continuante; apertura pyriformi; labro antice haud indentato. Long., 0.35; long. spir., 0.15; lat., 0.15. (Carpenter.)

Resembles the young of *M. centrifuga* Hinds, and is related to *Trophon muricatus* Hinds. (Carpenter.)

Shell thin, white, wide behind, narrow before; two nuclear and four normal whorls, the latter shouldered; rapidly narrowed to the front, with long, arcuated canal; varices about seven, acutely laminated, forming open, radiated, somewhat curved spines around the shoulder; there is an obsolete angle or line on the periphery. Length, .35 in. (Tryon, *Manual of Conchology.*)

TYPE in State Collection, No. 580*a*. Type locality, off Catalina Island, California.

RANGE. Catalina Island and San Pedro, California.

Trophon catalinensis n.sp.

Plate 34, figs. 1, 2, 3, 4, 5

Shell large, thin, yellowish brown; whorls seven, in addition to the nucleus; varices seven, wide and acutely laminated; the spines are guttered and rounded at the back; canal long, arcuate, and open the entire length. Interior of mouth polished and the inner lip has a thin wash of callus. Length of type, 100; breadth, including spines, 85 mm.

TYPE in Stanford University Collection. Type locality off San Pedro, California, in 25 fathoms.

RANGE. Known only from type locality.

This shell has been called *Trophon triangulatus* Carpenter. It is a much larger shell, Carpenter's shell measuring only 0.35 of an inch.

Type locality is about the same for both species.

Subgenus NEPTUNEA (Bolten, part, 1798) Dall, 1902

Trophon rotundatus Dall, 1902

Plate 30, fig. 8

Proceedings of the United States National Museum, 24:547. *Bulletin 112,* United States National Museum; Pl. 15, fig. 3.

Shell small, with rather short spire and five or more fully rounded whorls; nucleus eroded; subsequent whorls with (on the last) about fourteen keeled ribs, angular, but not spinose, at the shoulder, passing over the whorl to the base; spiral striation obsolete or none; aperture subovate, yellowish within; canal moderate, reduced. Long. of shell, 16; of aperture, and canal, 10; maximum lat., 7 mm. (Dall.)

Type in United States National Museum, No. 149614. Type locality, Bering Sea, southeast from the Pribilof Islands, in 74 fathoms.

Range. Known only from type locality.

Trophon dalli Kobelt, 1878

Conchylien Cabinet, 2d edition, Trophon, 275. *Proceedings of the United States National Museum,* **9**; Pl. 4, fig. 6, 1886.

Trophon muriciformis Dall in litteris. Testa clavaeforme in caudam gracilem, leviter ascendentem subito coarctata, tenuis; spira spec. unici quod exstat, fracta. Anfr. superst. 3 angulati, supra angulum impresso-tabulati, ad seriem tuberculorum squamiformium, supra et infra in lamellas varicosas productorum muniti, lamellis infra angulum obliquissime decurrentibus. Apertura ovata, in canalem longiorem, angustam desinens, columella leviter planata vix callosa, labro simplici. Long. (apice fracto), 40; lat. max., 22; alt. apert. circum., 32 mm. (Kobelt.)

Shell thin, compressed suddenly into a slender gently rising tail; spire of the single existing specimen broken. Remaining whorls three, angulate, above the angle impressed-tabulate, and, up to a row of squamiform tubercles above and below, elongate into varicose lamellae, strong threads with lamellae, which extend downward very obliquely below the angle. Aperture ovate, narrowing downward into a long canal, columella gently flattened scarcely callous. (Translation.)

Gehäuse keulenförmig, die Form ganz auffallend einem Diminutiv von *Busycon canaliculatum* ähnelnd, mit ziemlich langem, schlankem, leicht zurückgebogenem Stiel, ziemlich dünnschalig, doch fest. Das Gewinde ist an dem einzigen mir vorliegenden Exemplare—Dall hat uberhaupt nur zwei an der Beringsstrasse erhalten—abgebrochen; die übriggebliebenen drei Umgänge sind kantig, über der Kante eingedrückt und diese mit einer Reihe kleiner schuppenartiger Knötchen besetzt, von welchen aus niedere, varixartige Lamellen nach den Nähten laufen; nach unten laufen sie in schrägem Bogen nach vorn und sind auf dem letzten Umgang noch auf dem Stiel erkennbar. Eine Spiralskulptur ist nicht vorhanden. Die Mündung ist ziemlich oval, unten in den etwas längeren, leicht zurüchgebogenen Kanal ausgezogen, die Spindel wenig gebogen, etwas abgeflacht, kaum callös, der Aussenrand nehr gerundet, oben undeutlich kantig, einfrach, scharf. Die Farbung ist, so viel sich unter dem Bryozoen überzug des todt gesammelten Exemplares erkennen lasst schmutzigweiss. (Kobelt.)

Type locality, Bering Sea.

Range. Arctic Ocean to Straits of Juan de Fuca.

Trophon dalli alta Dall, 1902

Proceedings of the United States National Museum, **24**:548.

The spire exceptionally elevated. The chief peculiarity of this species, apart from its muricoid form, is the appearance of the spines on the shoulder, which vary in number from fifteen to twenty-one, and which often have an appearance as if they were independent of the varices and had been separately stuck on to the whorl. There are usually five whorls, exclusive of the nucleus, and full-grown specimens reach about 60 mm. in length. The spire and long canal are frequently distorted, and the aperture, usually white, is sometimes internally tinged with yellow. (Dall.)

TYPE in United States National Museum. Type locality, Bering Sea.

RANGE. Known only from type locality.

Trophon scitulus Dall, 1891

See Part I, Plate 15, fig. 4

Proceedings of the United States National Museum, **14**: 188; **17**; Pl. 27, fig. 5, 1894.

Shell thin, small, white, five-whorled; closely sculptured with regularly spaced, low, imbricate lamellae rising to spines at regular intervals on the spirals; on the upper whorls two, and on the last whorl six spirals, of which at the shoulder the hindmost bears the longest spines and is separated from the suture by a wide space; there are on the last whorl thirteen grooved spines on this spiral; canal long, recurved. Length of shell, 17.5; of aperture, 11; breadth of shell, 8.5 mm. (Dall.)

TYPE in United States National Museum. Type locality, U.S.S. "Albatross" Station 3227, off coast of Unalaska Island, Bering Sea, in 225 fathoms.

RANGE. Pribilof Islands to Unalaska Island, Bering Sea.

Trophon disparilis Dall, 1891

See Part I, Plate 15, fig. 8

Proceedings of the United States National Museum, **14**:189; **17**; Pl. 27, fig. 4, 1894.

Shell small, white, thin, elongate, with five whorls, with numerous, hardly raised, transverse ridges or lamellae on the sutural side of the last whorl, while the anterior part of the same whorl is sculptured with four, spiral, hardly raised ridges, and the transverse sculpture fails or becomes feebler; whorls rounded, suture deep, canal long, curved, aperture rounded, simple. Length of shell, 15; of aperture and canal, 11; breadth of shell, 7 mm. (Dall.)

Type in United States National Museum. Type locality, U.S.S. "Albatross" Station 3048, off coast near Gray's Harbor, Washington, in 52 fathoms.

Range. Straits of Juan de Fuca to Columbia River entrance.

Trophon cepulus Sowerby, 1880

Thesaurus Conchyliorum, Trophon, 61; Pl. 404, fig. 14; Pl. 405, fig. 27.

Testa alba, gracile bulbiformia laevis; spira acuminata, anfractibus declivibus, subangulatis, varicibus tenuibus subnumerosis, superne angulatis; ultimo anfractu subventricoso, in canalem angustum recurvum; longiusculum terminanti.

This species differs from *T. clathratus* in being more bulb-shaped, having the canal narrow, long and recurved, with shorter bulk for the last whorl, and having the varices thinner and more numerous. (Sowerby.)

Type in British Museum? Type locality, Bering Sea?

Range. Bering Sea and Aleutian Islands. Fossil: Pleistocene of North Japan, at Volcano Bay.

Trophon cymatus Dall, 1902

Proceedings of the United States National Museum, **24**:548.

A variety *cymata* has the angle obsolete and the whorls rounded. (Dall.)

Type in United States National Museum, No. 109091. Type locality, Pribilof Islands, Bering Sea.

Range. Known only from type locality.

Trophon elegantulus Dall, 1907

Plate 31, fig. 10

Miscellaneous Collections, Smithsonian Institution, **50**:165.

Shell thin, pellucid-white, with a nebulous brown band in front of the suture, on the last whorl in front of the periphery and a third on the canal; elongate, acute, slender, the whorls of the spire rotund, looking like the spire of a *Scala*; suture distinct, with two nuclear (eroded) and five subsequent whorls; varices 10 to 12, very thin, sharp, reflected, patulous near the suture, but not coronate or spinose; early whorls with three or four distant obscure, spiral threads which later become obsolete; the surface also finely closely spirally striate; aperture elongate-oval, outer lip thin, reflected; body with a wash of transparent callus, which is continued on the pillar as a thin elevated lamella continuous with the left-hand margin of the rather elongated and recurved canal; siphonal fasciole imbricate; interior of the aperture white, showing the color bands. Long. of shell, 31.5; of last whorl, 23; of aperture and canal, 18; max. lat. of shell, including the varices, 12.5 mm. (Dall.)

Type in United States National Museum, No. 110501. Type locality, Station 4784, in 135 fathoms, off Attu Island, Aleutian Islands.

Range. Known only from type locality.

Trophon beringi Dall, 1902

Plate 30, fig. 6; see Part I, Plate 18, fig. 8

Proceedings of the United States National Museum, **24**:544. *Bulletin 112,* United States National Museum; Pl. 10, fig. 6.

Shell greenish-white, elegantly ovate-fusiform, with a rather elongated curved canal, the aperture and canal longer than the spire; whorls with the base gradually attenuated, not constricted, about six in number, with a distinct but not deep suture and 9 to 12, low, sharp, rounded varices, with no obvious angle at the shoulder; surface with fine revolving striation, sometimes partly obsolete; aperture white. Long., 40; max. lat., 17; long. of spire above aperture, 16 mm. (Dall.) Operculum dark brown.

This is the shell regarded by Jeffreys, Adams, and Carpenter as *B. clathratus* in the north Pacific area; but if well-developed adult specimens be compared it will be seen that they are really not very similar. The young *B. beringi* are notably short and broad, and often show a pinkish tint with the varices whiter. (Dall.)

Trophon ithitoma Dall, 1919

Proceedings of the United States National Museum, **56**:337.

Shell elongated, slender, acute, with a yellowish tinge, with eleven varices, spinose at the shoulder, with five or more whorls, the apex decorticated; suture distinct, more or less undulated by the sculpture; the varices sharp and imbricating; sculpture only of obvious incremental lines and here and there a minute vermiculation; aperture elongate-oval, outer lip thin, sharp; body erased; pillar arcuate, twisted; canal long, narrow, curved. Height of shell, 38; of last whorl, 29; of aperture and canal, 25; diameter, 16 mm. (Dall.)

Type in United States National Museum, No. 222623. Type locality, United States Fish Commission Station 4255, in Taiya Inlet, southeastern Alaska, in 253 fathoms.

Range. Lynn Canal, Alaska.

Trophon multicostatus Eschscholtz, 1829

Plate 33, fig. 11

Zoölogical Atlas, Part II; Pl. 9, fig. 4, 1829.

Testa fusiformi, multifariam lamellosa; lamellis integris supra anguloso-acuminatis; labro integerrimo; cauda lata recta. (Eschscholtz.)

Die Schaale 13 Linien lang, die grösste Breite beträgt 7 Linien; ihre Farbe ist hellbräunlich. Die Spindel bildet einen zugespitzten Kegel; die Windungen sind schwach gewölbt und mit blätterformigen ziemlich dicken und ganzstandigen Erhöhungen besetzt, welche am obern Rande der Windungen in eine spitze heraufratende Ecke zusammengefaltet sind; man zählt ihrer auf der letzten Windung 9 bis 11. Die Oeffnung ist langlich rund, die dicke breite äussere Lippe ganzrändig, die innere Lippe auf der Säule aufliegend, beide stark glänzend und etwas bräunlich roth geflect. Der Kanal ist nicht viel kurzer als die Oeffnung, breit, offen und ziemlich gerade; der Nabel verdeckt. (Eschscholtz.)

Shell small, fusiform, whorls five, angular above, with twelve to fourteen raised varices; no spiral sculpture; aperture subelliptical; outer lip not effuse; inner lip smooth; canal short, slightly curved. Long., 10.5; lat., 4.5; body whorl, 7; aperture, including canal, 5; canal, 1 mm. (Arnold.)

TYPE in ? Type locality, Sitka, Alaska.

RANGE. Nunivak Island, Bering Sea, to San Pedro, California. Also northern Japan. Fossil: Pleistocene—Santa Barbara, San Pedro, California.

Trophon alaskanus Dall, 1902

Proceedings of the United States National Museum, **24**:545.

Shell creamy-white with a more translucent substratum, the nucleus eroded, and five subsequent whorls; the whorls are rounded and bear eight narrow varices which are only prominent at the shoulder where they rise into long blunt spines which curve backward and somewhat toward the axis of the shell; there is no spiral sculpture, the incremental lines are not conspicuous, but magnification shows the surface when not eroded to be covered with a fine, sagrinate or subgranular sculpture, unlike anything I have noted on the other species. The spire is elevated, the suture very distinct, the canal slender, long, and strongly curved; the aperture is subovate, the pillar white and polished, the outer lip thin and slightly patulous opposite the base of the pillar. Alt. of shell, 32; of spire (nucleus missing), 12; max. diam. of shell, exclusive of the spines, 14 mm. (Dall.)

TYPE in United States National Museum, No. 122594. Type locality, United States Fish Commission, Station 3227, Bering Sea, north of Unalaska, in 225 fathoms.

RANGE. Known only from type locality.

Trophon avalonensis Dall, 1902

Plate 33, fig. 9

Proceedings of United States National Museum, **24**:546.

Shell small, delicate, white, fusiform, with 1½ nuclear and five subsequent whorls; nucleus tilted, rounded, smooth; subsequent whorls finely spirally striated, with eight or nine sharp, appressed varices rising into radiant, narrow-grooved spines at the shoulder; suture very distinct, aperure subovate, canal moderate, more or less recurved, pillar twisted, anteriorly attenuated; base hardly constricted. Long. of shell, 16.5; of aperture and canal, 10.0; max. lat., 8 mm. (Dall.)

Type in United States National Museum, No. 109109. Type locality, off Avalon, Catalina Island, in 80 fathoms.

Range. Catalina Island to San Diego, California.

Trophon eucymata Dall, 1902

Plate 30, fig. 9

Proceedings of the United States National Museum, **24**:547.

Shell not spiny at the shoulder, larger, with 15 to 18 varices, hardly raised and barely angular at the shoulder. Long., *27*; max. lat., 9.5 mm. (Dall.)

Type in United States National Museum, No. 109087. Type locality, off San Diego, California, Station 2935, in 124 fathoms.

Range. Known only from type locality.

Trophon bentleyi Dall, 1908

Proceedings of the United States National Museum, **34**:249.

Shell small, slender, acute, ashy-white, with about seven whorls; nucleus with the surface eroded; suture distinct, the whorl in front of it somewhat tabulated by an obscure angle from which the spines arise; axial sculpture, besides incremental lines, only of about (on the last whorl) ten, sharp, depressed, lamellar varices, prominent only behind the periphery and feeble on the base; at the shoulder these are produced into high, usually recurved, gutted spines, which in some cases are nearly straight, in others curved toward the preceding whorl until they may even touch it; aperture ovate, canal long, slender, slightly recurved. Height, 19.5; of last whorl (without the spines), 14.5; of aperture and canal, 11.5; max. diam., 6.5 mm. (Dall.)

Type in United States National Museum, No. 110684. Type locality, San Diego Harbor, in 20 fathoms.

Range. Known only from type locality.

Trophon pacificus Dall, 1902

Plate 30, fig. 4

Proceedings of the United States National Museum, **24**:544.

This species resembles *T. beringi* in miniature except that it has, with the same number of whorls, closer and more numerous varices, and the throat is sometimes pale brownish. The varices number from 15 to 20, and the largest specimens measure from 20 to 27 mm. in length. (Dall.)

Type in United States National Museum, No. 109100. Type locality, Bering Sea?

Range. Arctic Ocean to Kamchatka to Acapulco, Mexico.

Trophon peregrinus Dall, 1902

Plate 33, fig. 12

Proceedings of the United States National Museum, **24**:543.

Shell small, yellowish-white, with eight whorls; nucleus rounded, smooth, tilted, with a whorl and a half; subsequent whorls with seven or eight procumbent broad varices, strongly angulated at the shoulder, where the varices form compressed elevated spines; behind the angle the whorl is somewhat excavated; base of the whorl constricted with a short, recurved, imbricate canal; aperture squarish, white within; surface with fine spiral striations. Long. of aperture and canal, 12; of shell, 23; max. lat., 11 mm. (Dall.)

Type in United States National Museum. Type locality, Catalina Harbor in 16 fathoms.

Range. Known only from type locality.

Trophon staphylinus Dall, 1919

Proceedings of the United States National Museum, **56**:338.

Shell white, slender, subturreted, of five or more whorls, the apex lost; suture distinct; axial sculpture of (on the last whorl, seven) sharp-edged varices, prominent only at the shoulder where they are produced into a small spine; there is no spiral sculpture except the angle at the shoulder; aperture obovate, simple; canal long, narrow, recurved; the body with a coat of enamel, the pillar very short; operculum normal. Height of spire, 9; of aperture, excluding the canal, 5.5; the canal, 6.5; diameter, 8 mm. (Dall.)

Type in United States National Museum, No. 209947. Type locality, United States Fish Commission Station 4415, off Santa Barbara Island, California.

Range. Sitka, Alaska, to Coronado Islands.

Trophon calliceratus Dall, 1919

Proceedings of the United States National Museum, **56**:338.

Shell small, white, with a smooth nucleus of one and a half whorls and five subsequent whorls; suture distinct, not appressed; varices sharp, a spine rising nearly vertically from the shoulder, guttered and slightly recurved, nine on the penultimate, eight on the last whorl, and extending from the suture to the base; spiral sculpture of extremely close, fine striation on the whorls above the base and in front of the shoulder; aperture semilunate, body erased, pillar long and attenuated; canal long, slender, slightly curved. Height of shell, 16; of last whorl, 12; of aperture and canal, 9; diameter, 6 mm. (Dall.)

TYPE in United States National Museum, No. 209914. Type locality, United States Fish Commission Station 4356, off Point Loma, California, in 120 to 131 fathoms.

RANGE. Monterey to San Diego, California.

Trophon macouni Dall, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N;* Pl. 1, fig. 7.

Shell small, dark purple, with the prominences white. Whorls about six, the nuclear smooth and submammillary; the succeeding whorls with (on the last, nine) prominent, thin, sharp varices, sharply angulated at the shoulder; whorls subtabulate, the suture distinct but not deep; sculpture (beside the varices) of two to seven, low, revolving, flat ridges which appear whitish against the purple ground-color, and numerous fine, spiral, almost microscopic lines often obsolete; besides the angle at the shoulder there are usually two of these ridges on the spire behind the last whorl; they hardly modify the varices; aperture small, subovate, with the outer lip somewhat expanded; canal white, rather long and narrow, directed somewhat toward the left. Height of shell, 13.0; of the last whorl, 9.0; max. diam., 6.0 mm. (Dall.)

TYPE in Ottawa. Type locality, the ship channel, Barkley Sound, Vancouver Island, British Columbia.

RANGE. Port Althorp, Alaska, to Barkley Sound, British Columbia.

Trophon orpheus Gould, 1849

Plate 30, fig. 14

Proceedings of the Boston Society of Natural History, **3**:142.

Testa parva, elongata, cinerea; spira turrita, anfractibus sex superne angulatis, lamellis acutis longitudinalibus muricatis et filis transversis cinctis; anfractu ultimo postice ventricoso, antrorsum in rostrum vix reflexum attenuato; apertura elliptica, dimidiam longitudinis testae, postice angulata; labro acuto; columella antice intrudente; fauce carnicolori. Long., ½; lat., ⅕ poll. (Gould.)

Shell minute, fusiform, thin, elongated, turreted, cinerous with numerous longitudinal, lamellar sharp, muricated ridges, thirteen on the last whorl, angular near the suture, crossed by rounded raised threads of considerable size, which commence gradually in front of a rib and terminate on the succeeding one, two or three on the upper whorls, five or six on the last, neither set continued upon the beak. Whorls six, with a broad shoulder near the suture, angular, the last two-thirds the length of the shell, ventricose above, the lower half terminating in a slender beak, a little recurved. Aperture half the length of the shell, elliptical; lip angular posteriorly, a little everted, sharp and simple; pillar with a slight intrusion at the commencement of the canal; interior pale flesh-color. (Gould.)

TYPE in Boston Academy of Science. Type locality, Puget Sound.

RANGE. Victoria, British Columbia, to off the Columbia River, Oregon.

Trophon smithi Dall, 1902

Plate 33, fig. 14

Proceedings of the United States National Museum, **24**:542.

Shell much resembles *T. stuarti* in general, but differs by more slender whorls with a more constricted suture, relatively wider varices, and the absence of any spiral sculpture. It has six to eight varices, very thin, wide, and sharp with high, strongly recurved spines at the shoulder. The canal is strongly recurved, and imbricating remnants of old canal ends are noticeable on the siphonal fasciole. Length, 47; width, 23 mm. (Dall.)

TYPE in United States National Museum, No. 122582. Type locality ?

RANGE. Pribilof Islands, Bering Sea, to Santa Barbara, California.

Trophon stuarti E. A. Smith, 1880

Plate 33, fig. 13

Proceedings, Zoölogical Society of London, 481; Pl. 48, fig. 6.

Testa breviter fusiformis, alba. Anfractus 7, superne planati et angulati lateribus planis, costis late lamelliformibus, aliquanto obliquis, erectis, superne ad angulum valde sursum productis dextrorsumque curvatis, costis transversis (in anfr. superioribus 2–3, in ultimo 4) æquidistantibus, et supra longitudinalibus continuis instructi. Apertura irregulariter ovata, inferne in canalem producta. Canalis curvatus, retrorsus, aperturam fere æquans. Columella leviter arcuata, callo tenui extus libera induta. Labrum expansum, costa ultima lamelliformi extus munitum. Long., 53; diam., 21; long. apert., 31; lat. intus, 10 mm. (Smith.)

This is a pure white shell, remarkable on account of the thin lamellae which adorn it. At the upper part, at the angle of the whorls, these are much prolonged upwards, hollow on one side, ridged on the other, and curved to the right. Of the spiral lirae, that at the angle is rather stouter than the rest. Upon the upper whorls they are proportionally more elevated than upon the last, and with the longitudinal lamellae, form a coarse reticulation. Upon the body-whorl, toward the lower part, they cease to be erect, are lapped one upon another, and form an imbricated caudal ridge subparallel with the canal. The entire surface is both spirally and longitudinally minutely striated, a feature observable only under a lens.

TYPE in Dr. J. Percy's Collection. Type locality, Vancouver Island, British Columbia.

RANGE. Shumagin Islands, Alaska, to San Diego, California.

SECTION TROPHONOPSIS Bucquoy, Dautzenberg, and Dollfus, 1882

Trophon tenuisculptus Carpenter, 1866

Plate 30, figs. 3, 7

Annals and Magazine of Natural History, series 3, **17**: 277. Tryon, *Manual of Conchology,* **2**: 139; Pl. 33, fig. 359.

T. testa *T. barvicensi* simili, sed sculptura minus extante; vertice nucleoso minimo; anfractibus uno et dimidio lævibus, apice acuto; normalibus v., tumidis, postice subangulatis, suturis impressis; costis radiantibus x–xiv, plerumque xii, haud varicosis, angustis, obtusis; liris spiralibus majoribus, distantibus, quarum ii–iii in spira monstrantur, aliis intercalantibus, supra costus radiantes undatim transeuntibus; toto superficie lirulis incrementi, supra liras spiralis squamosis, eleganter ornata; canali longiore, subrecta, vix clausa; labro acutiore, postice et intus incrassato, dentibus circ. v munito; labio conspicuo, lævi; columella torsa. (Carpenter.)

Shell small, fusiform; whorls five, angulated above, forming a slightly sloping, tabular band above; ornamentations of numerous transverse ridges and several spiral lines; suture deeply impressed; aperture elliptical; outer lip thin; inner lip incrusted, smooth; canal narrow; columella long, twisted. (Arnold.)

TYPE in British Museum? Type locality, Pleistocene of Santa Barbara, California.

RANGE. Southeastern Bering Sea to Todos Santos Bay, Lower California. Fossil: Pleistocene—Santa Barbara, California; Pliocene, San Pedro, California.

Trophon lasius Dall, 1919

Proceedings of the United States National Museum, **56**:338.

Shell fusiform, slender, white, with a dingy brownish periostracum and more than five whorls, the apex defective; suture distinct, the whorls prominently rounded; axial sculpture of numerous elevated incremental lines which imbricate or nodulate the spiral sculpture at their intersections;

spiral sculpture of (on the early whorls, 4; on the penultimate whorl by intercalation, 8; on the last whorl, about 25) narrow cords with wider or subequal interspaces, increasing by intercalation until on the last whorl they become practically equal and mostly minutely imbricated; aperture ovate; outer lip thin, simple; body erased; canal long, narrow, recurved; axis minutely pervious, pillar short, gyrate. Height of shell, 30; of last whorl, 24; of aperture and canal, 19; diameter, 10.5 mm. (Dall.)

Type in United States National Museum, No. 210087. Type locality, United States Fish Commission Station 4515, off Point Pinos, California, in 198 to 495 fathoms.

Range. Known only from type locality.

Trophon apolyonis Dall, 1919

Proceedings of the United States National Museum, **56**:337.

Shell small, white, subturreted, with more than four whorls, the apex eroded, the suture distinct; axial sculpture of (on the last whorl, 13 to 15) sharp low varices with wider interspaces, sometimes feebly angular at the shoulder on the spire but on the last whorl the angle is blunted or obsolete; there is no spiral sculpture, and the incremental lines are not conspicuous; aperture rather wide, ovate white, the outer lip reflected at the varices; body and pillar with a coat of white enamel; canal narrow, slightly recurved, rather long; the base of the last whorl gently constricted. Height of three whorls, 21; of last whorl, 17; diameter, 10 mm. (Dall.)

Type in United States National Museum, No. 209303. Type locality, United States Bureau of Fisheries Station 4423, in vicinity of the Santa Barbara Islands, California.

Range. Known only from type locality.

Trophon tripherus Dall, 1902

Plate 33, fig. 10

Proceedings of the United States National Museum, **24**:545. *Bulletin 112,* United State National Museum; Pl. 15, figs. 8, 9.

Shell small, thin, delicate, white, with a thin yellowish periostracum and about five whorls; nucleus eroded in all specimens; early whorls tabular, with about 14 low, sharp varices, sharply angulated, but hardly spinose on the shoulder, and growing feebler on the subsequent whorls; below the shoulder are three feeble spiral threads which slightly undulate the varices; these threads grow feebler with age, and are hardly perceptible on the last whorl; aperture ovate, passing into the long, slightly twisted canal, which is strongly recurved; suture very distinct; outer lip thin, deeply flexuous behind; pillar thin, attenuated in front, twisted with a pervious axis; operculum normal, pale brown. Long. of shell, 22.5; of spire without the nucleus, 7; max. lat. of shell, 9 mm. (Dall.)

Types in United States National Museum, Nos. 109044 and 109045. Type locality, U.S.S. "Albatross" Station 3343, off Destruction Island, Washington.

Range. Straits of Juan de Fuca to San Diego, California, and off Pledras Blancas, Lower California.

Trophon kamchatkanus Dall, 1902

Plate 30, fig. 10

Proceedings of the United States National Museum, **24**:541. *Bulletin 112,* United States National Museum; Pl. 10, fig. 7.

Shell small, solid, yellowish-white, with about five whorls; nucleus lost; subsequent whorls (on the fifth twenty-one) low, rude, riblike varices, crossed by four or five obscure revolving cords, of which two are visible behind the sutures; in front of the suture is a sloping space somewhat constricted, at the shoulder is a cord, followed by others with wider interspaces and toward the canal more feeble; the incremental lines are also conspicuous; canal twisted, recurved, rather short and wide, aperture white, body and pillar callous, the latter twisted and obliquely truncate in front forming a nearly pervious axis. Long. of shell, 25; of aperture and canal, 15; max. diam., 12 mm. (Dall.)

Type in United States National Museum. Type locality, United States Fish Commission Station 3644, southeast coast of Kamchatka.

Range. Western Bering Sea, in 100 fathoms.

Trophon tolomius Dall, 1919

Proceedings of the United States National Museum, **56**:337.

Shell small, short, inflated, white, with an angular shoulder near the periphery on the spire, with more than four whorls (the apex defective), the suture distinct, not appressed; axial sculpture of (on the last whorl, about 35) sharp ribs, regularly spaced, with wider interspaces, extending from the suture over the base; these ribs only become lamellose with senility; the canal is axially striated and the incremental lines visible; on the upper spire the intersection of the ribs and shoulder angle tends to become nodulous; aperture rounded, simple, body erased, canal narrow, a little recurved. Height of shell, 19; of last whorl, 15; of aperture, 10; diameter, 10 mm. (Dall.)

Type in United States National Museum, No. 222441. Type locality, United States Fish Commission Station 2896, off San Miguel Island, California.

Range. Known only from type locality.

Genus **THAIS** Bolten, 1798

The genus *Thais* of Bolten is well-constituted, containing a very uniform assembly of species which, with a single exception of a closely related *Acanthina,* will remain in the genus as at present understood. The genus *Thais* will comprise even more than was supposed by its author. The small lirations or tubercles on the pillar near its anterior end are often present or absent indifferently in specimens of the same species, or even in the same individual at different ages, and are of vastly different value from the permanent plaits on the pillar, which is present at all ages of the individual. The sculpture is also, as is well-known, liable to vary from smooth to imbricate or nodulous within the limits of the species. The prevalent sculpture in the group is spiral, modified into ridges, scales, nodes, or even spines. The species represented on our coast are in the Subgenus *Nucella* Bolten.

Type. *Thais lapillus* Linnaeus.

Distribution. Atlantic and Pacific coasts of North America.

Subgenus Nucella Bolten, 1798

Thais lamellosa Gmelin, 1792

Plate 38, figs. 1, 2, 4; Plate 35, fig. 7

Systema Naturae, **7**: 3498. *Proceedings of the United States National Museum,* **49**: 563; Pl. 74, figs. 5–8.

Testa subplicata transversim costata sulcata tuberculata lamellosa brunneo alboque fasciata. (Gmelin.)

Shell fusiform, thick; spire elevated; apex subacute; whorls five to seven, convex or angulated, with one or more prominent spiral ridges on angular part of whorl; suture impressed, distinct; aperture ovate or elliptical; outer lip effuse, generally denticulate; inner lip incrusted, smooth; canal short, curved backward; umbilicus subperforate. Long., 34; lat., 20; body-whorl, 26; aperture including canal, 22.5; canal, 6 mm. (Arnold.)

Range. Port Clarence, Bering Strait, and southward on the west to Sado Island, Japan Sea; on the east to the Aleutian Islands, and Santa Barbara, California. Fossil: Pleistocene and Pliocene of California and Oregon.

Shell large, heavy, smooth, with rounded whorls and deep though appressed sutures, resembling a very thick and heavy *Chrysodomus.* The measurements are about the same as in the typical form.

Type in United States National Museum. Type locality, Cook's Inlet.

Range. Known only from type locality.

Thais lamellosa franciscana Dall, 1915

Plate 35, fig. 6

Proceedings of the United States National Museum, **49**:565; Pl. 74, fig. 6.

Shell subfusiform, heavy, with a subconic spire shorter than the aperture, laminate reduced to obsolete low imbrications or usually none; whorls flattened behind the shoulder; major spirals low, feeble, two on the penultimate whorl, seven or more on the last whorl, minor spirals obsolete or none; aperture large, the outer lip flaring, umbilical chink usually distinct but closed. Height of shell, 51; of last whorl, 42; breadth, 29 mm. (Dall.)

TYPE in United States National Museum, No. 63909. Type locality, San Francisco Bay, California.

RANGE. Known only from type locality.

Thais lamellosa neptunea Dall, 1915

Proceedings of the United States National Museum, **49**:565.

Shell large, heavy, smooth, with rounded whorls and deep though appressed sutures, resembling a very thick and heavy *Chrysodomus.* The measurements are about the same as in the typical form.

TYPE in United States National Museum. Type locality, Cook's Inlet.

RANGE. Known only from type locality.

Thais lamellosa hormica Dall, 1915

Plate 38, figs. 3, 5; Plate 35, fig. 8

Proceedings of the United States National Museum, **49**:565: Pl. 74, fig. 8.

Shell of smaller size than either of the preceding, thin, with spire subacute, produced, longer than the aperture; whorls angular with more or less prominent axial laminae, 10 or more to the last whorl, often produced at the angles into gutted spines; major spirals two on the penultimate, five or six on the last whorl; aperture small, the outer lip hardly expanded, only moderately callous; the umbilical chink usually obsolete. Height of shell, 48; of last whorl, 32; breadth, 20 mm. (Dall.)

TYPE in United States National Museum, No. 88862. Type locality, inner part of Sitka Harbor, Alaska.

RANGE. Sitka, Alaska, to Puget Sound.

Thais lamellosa cymica Dall, 1915

Plate 35, fig. 5

Proceedings of the United States National Museum, **49**:565; Pl. 74, fig. 5.

Shell short, robust, heavy, very thick, spire short-conic, shorter than the aperture, one mutation being sparsely laminate, the other with a smooth surface; whorls flattened behind the shoulder; major spirals obsolete or none; when present, there is one on the penultimate whorl and five or six on the last whorl; aperture large, outer lip flaring, umbilical chink usually concealed by the callus. (Dall.)

Type in United States National Museum. Type locality, rocks exposed to the surf, coast of Washington.

Range. Known only from type locality.

Thais lamellosa sitkana Dall, 1915

Proceedings of the United States National Museum, **49**:566; Pl. 74, fig. 4.

Shell resembling var. *hormica,* but smaller and thinner, the spire produced, subarcuate, longer than the aperture; whorls rounded, with no lamination; major spirals conspicuous, two on the penultimate, five or six on the last whorl; aperture small, outer lip not reflected, usually with a deep umbilical chink. Height of shell, 38; of last whorl, 25; breadth, 18 mm. (Dall.)

Type in United States National Museum. Type locality, inner harbor, Sitka, Alaska.

Range. Known only from type locality.

Thais lima Martyn, 1784

Plate 36, figs. 4, 5, 6

Universal Conchology, Figures of Nondescript Shells; Table 2, Pl. 46. *Proceedings of the United States National Museum,* **49**: 566; Pl. 75, figs. 4–6.

Shell of three and a half to four rounded whorls, not including the nucleus; moderately thick with a spire much shorter than the aperture, the last whorl much the largest; with a tolerably uniform spiral sculpture of alternated major and minor spiral cords; aperture large, outer lip not reflected and seldom thickened, more or less crenulated by the sculpture; pillar slightly arcuate, flattened anteriorly, the canal narrow and curved to the left; umbilicus sometimes sealed, at others showing a deep narrow perforation behind the callus of the reflected pillar. Height of shell, 60; of last whorl, 54; breadth, 36 mm. (Dall.)

Type in Martyn Collection. Type locality, King Georges Sound.

Range. Kutzebue Sound, Arctic Ocean, to Bering Strait, Kamchatka, the Kuriles, and Japan; east to the Aleutian Islands; Monterey to San Diego, California, and Cerros Island, Lower California.

Thais emarginata Deshayes, 1839

Plate 36, figs. 2, 3

Revue de la Zoologique, Société Cuvierienne, 360. Guérin, *Magasin de Zoologie,* 1841; Pl. 25.

Testa ovata, apice acuta, transversim costata, irregulariter squamosonodosa, albo-grisea vel fulva; apertura ovato-anguata, utrinque attenuata; labro acuto, in medio inflexo et emarginato. (Deshayes.)

Shell thick, solid, rotund, with a short spire of about three whorls without the nucleus, the body rude, with coarse nodulous or subspinose major spirals, a more or less flaring, thickened, outer lip, a very arcuate flattened pillar, short and hardly recurved canal, and sealed umbilical convexity. Height of shell, 30; of last whorl, 28; of aperture, 23; breadth, 23 mm. (Dall.)

TYPE in Museum Cuming. Type locality, California.

RANGE. Bering Island and the Okhotsk Sea on the west; on the east from Hagemeister Island and Bering Sea, south of the winter floe-line, and southeastward to California; Cerros Island, Lower California; Mazatlan and Topolobampo, Mexico.

Thais emarginata ostrina Gould, 1852

Plate 36, fig. 1

Mollusca and Shells of the United States Exploration Expedition, 244; Pl. 18, figs. 310, *a–b.*

Testa parva, solida, rudis rotundato-ovato, patula, exalbida, purpurascens, interdum fasciis geminatis rubidis cincta; spira brevis, conica, anfractibus quattuor vel quinque obtuse angulatis, convexis; ultimo amplissimo, ventricoso; apertura rotundato-ovalis, livido-tincta; labro simplici, patente; columella excavato-planulata; sinu siphonali angusto, minime profundo, brevi.

Shell small, solid, broad-ovate, purplish, banded with brown lines, generally in pairs, faintly marked with the lines of growth, and sometimes with obtuse revolving ribs. Whorls four or five, obtusely angular posteriorly, convex, the last comprising most of the shell, very broad-ovate. Aperture large, patulous, oval; inner lip expanding, smooth, simple, pillar broadly flattened, regularly arcuate, chestnut-colored; aperture livid chestnut, paler near the lip. Length, nearly one inch; breadth, three-fifths of an inch. (Gould.)

TYPE in State Museum, Albany, New York, Nos. 6358 and 2557. Type locality, Tillamook, Oregon.

RANGE. Oregon to California.

Thais emarginata projecta Dall, 1915

Plate 37, figs. 4, 5

Proceedings of the United States National Museum, 49:571; Pl. 75, fig. 3.

Shell thinner, more elongate, and with a pointed spire, the major and minor spirals more nearly equal, two strong spirals on the earlier whorls and the sutures more constricted. This is the most northern form. Height of shell, 31; of last whorl, 24; of aperture, 19; breadth, 16.5 mm. (Dall.)

Type in United States National Museum. Type locality, Sitka, Alaska.

Range. Sitka, Alaska, to Puget Sound, Washington.

Thais canaliculata Duclos, 1832

Plate 35, figs. 3, 4

Annales des Sciences Naturelles, **26**: 104; Pl. 1, fig. 1.

Cette espèce voisine de *Purpura succincta* de M. de Lamarck's en distingue éminemment par sa taille plus petite, plus élancée, par ses cordelettes plus fines et sa couleur rougeâtre. Eile est oblongue striée profondément dans toute sa longueur, et de plus ornée d'un canal spiral fortement prononcé que ne se rencontre que dabs deus espèces du même genre. La columelle est lisse, blanche, légèrement aplatie; le bord gauche est uni â l'intérieur et de teinte rosèe, le test mince. Long., 16 lignes. (Duclos.)

Shell bucciniform, of three and a half to four rounded whorls exclusive of the nucleus, moderately thick, with a spire about one-half shorter than the aperture, the last whorl largest, with a very uniform sculpture of strong elevated spiral ridges separated by distinctly channeled interspaces crossed by small slightly elevated axial lamellae or elevated lines; minor spirals very rarely occur; there are 4 to 6 major spirals on the penultimate whorl and about 10 on the last whorl; outer lip not reflected and only slightly thickened, usually crenulated by the external sculpture; pillar moderately arcuate, flattened in front where the callus conceals but does not seal a long narrow umbilical chink; canal narrow, recurved. (Dall.)

Type in Museum Paris. Type locality, California.

Range. The whole Aleutian chain, eastward to Sitka and southward to Monterey, California.

Thais canaliculata analoga Forbes, 1850

Plate 35, fig. 1

Proceedings, Zoölogical Society of London, 275; Pl. 11, fig. 12.

P. testa turrita, albida, spiraliter late rufo-fasciata; spira exserta; anfractibus 5 rotundatis, costis spiralibus (6 ad 8 in anfractu penultimo), quadratis, numerosis cinctis, interstitiis crenulatis, ad suturam obsoletis labro subdenticulato. Long., 1 4/12; lat., 8/12; long. apert., 8/12 unc.

Similar to the preceding but stouter, usually with one more whorl, and with a minor spiral regularly intercalated between the major spirals. Height of shell, 47; of last whorl, 37; of aperture, 27.5; breadth, 27 mm. (Dall.)

Type in ? Type locality, coast of California.
Range. California. (Forbes.)

Thais canaliculata compressa Dall, 1915

Plate 35, fig. 2

Proceedings of the United States National Museum, **49**:569; Pl. 74, fig. 2.

Shell similar to the typical form but with the elevated ridges or major spirals flattened down until the interspaces become almost linear. There are 6 or 7 on the penultimate whorl and 12 or 13 on the last whorl. Height of shell, 34; of last whorl, 29; of aperture, 23; breadth, 22 mm. (Dall.)

Type in United States National Museum, No. 60102. Type locality, Monterey, California.

Range. Known only from type locality.

Genus **ACANTHINA** Fischer, 1807

Coquille semblable à celle des *Purpura;* labre portant à sa partie antérieure et près du canal une dent conique plus ou moins longue; bord columellaire aplati, simple. Opercule de *Purpura.* (Fischer.)

Shell ovate, last whorl large; spire rather elevated; aperture semilunar; inner lip wide and flattened; inner lip crenulated, with a prominent tooth at the fore-part. (Tryon, *Structural and Systematic Conchology.*)

Type. *Acanthina imbricata* Lamarck.

Distribution. California to Chile. Fossil: Tertiary of Chile.

Subgenus ACANTHINUCELLA Cooke, 1918

Acanthina spirata Blainville, 1832

Nouvelles annales du Museum, Paris, **1**: 252; Pl. 12, fig. 8.

Coquille de 12 lig. de long. sur 6 de large, éspaisse, solida, ovale, fusiforme, a spire assez élevée, subturriculée, formée de quatre a cinq tours, dont les premiers sont cordonnes par des séries decurrentes de squames, le dernier seulement strié; ouverture ovale, subcanaliculée, columelle lisse, subombiliquée, cinq denticules au bord droit; couleur brune en dehors, d'un blanc violet an dedans. (Blainville.)

Shell fusiform, whorls with a salient angle; flattened above; spirally sulcate; sulci with transverse lamellar striae; the third whorl from the apex longitudinally costellate; color pale, with angular dark-brown spots; within white, with two or three purple spots; tooth very slender. (Conrad.)

This is Conrad's description of his species *engonata,* which is the same as *spirata.*

TYPE in Paris Museum. Type locality, near Santa Barbara, California. Blainville gives for type locality "Des iles Sandwich," which is a mistake or his shell was a ballast one.

RANGE. Puget Sound to San Diego, California, and Socorro Island.

Acanthina spirata aurantia Dall, 1908

Proceedings of the United States National Museum, **34**:248.

Shell smaller than the typical, with the interspaces of the spiral threads prettily lamellose axially and more or less articulated with blackish-brown small spots; color orange-yellow. Interior of the outer lip thickened and with six or seven well-marked denticulations. Length, 18 mm. (Dall.)

TYPE in United States National Museum, No. 199893. Type locality, San Pedro, California.

RANGE. San Pedro to Newport, California.

Acanthina paucilirata Stearns, 1871

Conchological Memoranda, No. 6:1. *American Journal of Conchology;* Pl. 14, fig. 16.

Shell moderately elevated, whorls four to six; body whorl four-fifths the total length, angulated above and excavated between the angle and the suture; a sharp groove behind the tooth. Upper whorls canaliculated, nucleus smooth. Aperture elongate, purple-brown in the throat; outer lip sharp, yellowish, internally denticulated, with a prominent tooth at its outer edge. Columella purple, canal short, umbilicus nearly covered by the columellar callus. Siphonal fasciole strong. Externally painted with longitudinal broad-black and narrow-whitish streaks, interrupted by the white dental groove and three or four, narrow, yellowish, revolving carinae, which, except the keel, are inconspicuously elevated. Long., .55; lat., .33 in. (Stearns.)

TYPE in United States National Museum. Type locality, Coronado Islands, off San Diego, California.

RANGE. San Pedro, California, to Cerros Island, Lower California.

Subgenus ACANTHINA s.s.

Acanthina lugubris Sowerby, 1822

The Genera of Recent and Fossil Shells, Monoceros, fig. 3.

Mon. testa ovata, subventricosa, anfractibus costis tribus vel quaternis rudis cingulatis, costis hic illic tumidis, inciso-striatis, interstitiis lacunosis, aperturae fauce denticulata, dente marginali longissimo incurvo; fusca, maculis flammulisve nigris variegata, columella et aperturae fauce purpureo-fuscis.

Shell ovate, somewhat ventricose, whorls encircled with three or four rude ribs, ribs swollen here and there, engraved with striae, interstices guttered, interior of the aperture denticulated, marginal tooth very long, curved inward; brown, variegated with black blotches or flames, columella and interior of the aperture purple-brown. (*Conchologica Iconica.*)

Type in Museum Cuming. Type locality, California.

Range. San Diego, California, to Magdalena Bay, Lower California, and the Galapagos Islands.

Genus **FORRERIA** Jousseaume, 1880

Shell large, whorls six or seven, spinose on the shoulder; canal long and somewhat recurved; umbilicus wide and deep. Outer lip smooth, with a prominent spine or tooth, inner lip with a thin wash of callus. (I. Oldroyd.)

Type. *Chorus belcheri* Hinds.

Distribution. California and Japan.

Forreria belcheri Hinds, 1843

Plate 32, figs. 2, 5

Proceedings, Zoölogical Society of London, 127. *Zoölogy of the Voyage of H.M.S. Sulphur;* Pl. 2, figs. 1–2, 1844.

Mur. testa magna, fusiformi, crassa, ponderosa, pallide fusca, multivaricosa; anfractibus quadratis, albo fasciatis; varicibus numerosis, foliaciis simplicibus, superne elongatis, fornicatis, aetate valde erosis; apertura quadrata, pallide carnea; labro intus laevi, inferne dente magno, crasso, obtuso; canali tortuoso, aperto, ad sinistram inclinato; umbilico praecipue magno. Axis, 66 lin. (Hinds.)

Shell very light brown, sometimes with two obscure darker bands; aperture white within. Length, 3–5 in. (Tryon, *Manual of Conchology.*)

Type in British Museum? Type locality, San Diego, California.

Range. San Pedro to San Diego, California, to Scammons Lagoon, Lower California.

Family CORALLIOPHILIDAE

Genus **CORALLIOPHILA** H. and A. Adams, 1853

Shell with the outer and inner lips irregular, moderate, not produced into an extended process closing the aperture. (H. and A. Adams.)

Type. *Coralliophila neritoides* Lamarck.

Distribution. Central Pacific, Hawaiian Islands, West Indies, South Africa, Java, Japan, Mazatlan Panama, Galapagos Islands.

Subgenus Pseudomurex Monterosato, 1872

Coralliophila kincaidi Dall, 1919

Plate 30, fig. 13

Proceedings of the United States National Museum, **56**:339.

Shell fusiform, dirty white, with about six shouldered whorls, the nucleus decorticated, the suture deep, very narrow; axial sculpture of nine rather sharp vertical ribs extending from the suture to the canal with wider interspaces; spiral sculpture of (on the penultimate whorl, eight) strong, subequal cords, with narrower deep interspaces covering the whole shell, all furnished densely with short guttered lamination as usual in the genus; aperture ovate, outer lip simple, fringed by the external sculpture, inner lip glazed with white enamel; canal rather long, bent to the left, narrow, open, with a strong laminose fasciole. Height of shell, 30; of last whorl, 21; diameter, 15 mm. (Dall.)

Type in United States National Museum, No. 183067. Type locality, Puget Sound, Washington.

Range. Known only from type locality.

Coralliophila costata Blainville, 1832

Nouvelles annales du Museum, Paris, **1**:232; Pl. 11, fig. 8.

Coquille petite (fig. 11) lig. sur. 7, épaisse, solide, ombiliquée fusiforme, sub caudée, à spire assez élevée, formée de quatre à cinq tours étages, caréués, traverses par des stries egates, et par des costules au nombre de neuf sur le dernier; ouverture assez petite, ovale, terminée en avant par un petit canal subascendant; couleur d'un gris-blanc en dehors, d'un blanc de porcelaine en dedans. (Blainville.)

Opercule de Pourore.

Cette petite espèce, dont nous n'avons vu qu'un seul individu faisant maintenant partie de la collection de Muséum, est bien aisée á distinguer de toutes les autres par l'existence d'un canal évident; quoique court; aussi sans la connoissance de l'opercule on auroit pu avoir quelque doute sur le genre auquel elle appartient.

Type in Museum Paris. Type locality, Mazatlan, Lower California. De l'Ocean Pacifique, sur la côte de Mazatlan, d'oú elle a été rapportée par M. P. E. Botta.

Range. San Miguel Island, California, to Panama.

Family EPITONIIDAE

Genus **EPITONIUM** Bolten, 1798

Shell mostly pure white and lustrous, umbilicated or imperforate; spire elongated, the apex more or less inflected; whorls numerous, rounded, in contact or separated, ornamented with longitudinal ribs or thin lamellae, often continuous across the suture; periostome entire, thickened, reflected. (Tryon, *Manual of Conchology.*) (*Scalaria* Lamarck, 1801; *Scala* Humphrey.)

Bolten did not describe his genus *Epitonium,* but gave *E. scalaria* Linnaeus as the type.

Distribution. Greenland, Norway, Britain, Mediterranean, West Indies, China, Australia, Pacific, West America. Fossil: Triassic—Britain, North America, Chile, India.

The geographical distribution of the *Scalidae* agrees in many respects with the corals, the number of species being largest in the tropical seas, chiefly on the coral islands, and smallest toward the poles. Thus in the north polar region are found only four species: *Scala grönlandica* Perry is circumpolar; in the sea of Greenland and Labrador is found besides this species *Scala* (*Acirsa*) *borealis* Beck (*S. eschrichtii* Holb.), which is not found recent on the European side of the Atlantic Ocean but occurs fossil in Sweden (Uddevalla), Ireland.

In the northern part of the Pacific Ocean are found, besides *Scala grönlandica; S. wroblewskii* Mörch (*Scalaria borealis* Gould not Beck), *Scala ochotensis* Midd., which may be considered a gigantic *S. borealis* Beck. In the south polar regions *S. wroblewskii* is represented by *S. australis* Lam. which resembles it so closely that Dr. Gould considered it identical, and for this reason retired his species. *S. borealis Beck,* is represented by *S. granosa* Qet. G., which was considered a *Turritella* on account of the want of ribs.

On the American Pacific coast line, from Vancouver Island to Upper California, Dr. Carpenter has enumerated about eleven species. In the tropical region from California to Peru, twenty-six species. On the south coast of South America influenced by the polar stream, no species is indicated except *S. magellanica* Phil. from the Straits of Magellan.

The number of living species is probably about 240.

Subgenus Opalia H. and A. Adams, 1853[1]

Epitonium wroblewskii Mörch, 1876

Plate 31, fig. 5

Conchologia Iconica, Scalaria.

Sca. testa crassa, albida pyramidata, latiuscula; anfractibus octo, antice obtuse carinatis, ad latera rectiusculis, infra carinam subcomplanatis; varicibus paucis, rotundis, indistinctis, inaequalibus, irregularibus, nonnullis medio subevanidis, ad suturum subnodosis; apertura subquadrata, labio externo crasso, rotundo, columella rectiuscula, antice subcuneata.

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[1] For description of new species received while this volume was in press, see Appendix, p. 279.

Shell thick, whitish, pyramidal, rather broad; whorls eight, anteriorly obtusely keeled, rather straight at the sides; a little flattened below the keel; varices few, rounded, indistinct, unequal, irregular, some partly disappearing in the middle, somewhat nodose at the suture; aperture squarish, outer lip thick, rounded; columella rather straight, rather cuneate in front. (Gould.)

TYPE in British Museum. Type locality, Vancouver Island, British Columbia.

RANGE. Forrester Island, Alaska, to San Diego, California.

This is Gould's description for his *Scalaris borealis* 1852, but not *Scalaria borealis* (Beck) Lyell, 1839.

Epitonium evictum De Boury, 1919

Journal de Conchyliologie, **14**, No. 1:36.

Parmi les Opalia une espèce nouvelle des lies Forrester (Alaska), qui descend jusqu'à San Diego, est nommée *S. pluricostata* Or. des 1913, j'avais proposé le même nom pour une autre *Scalaire* (1913, *Jour. de conch.,* Vol. LXI, p. 97). Le nom de *S. pluricostata* a dû être employé plusieurs fois dans les collections pour une coquille qui, en realité, doit être toujours la même Très autrefois M. Dall m'avait envoyé cette forme sous le nom de *S. pluricostata* Stearns, mais je ne sache pas que cet auteur ait jamais publié une *Scalaire* sous ce nom. Du reste, M. Dall, reprenant l'espèce en 1917 et la citant comme nouvelle, en avait perdu tout souvenir. D'autre part, Berry (1907, "Fauna of Monterey Bay," *Nautilus,* Vol. XXI, p. 312) a cité un *S. (Opalia) pluricostata* Carpenter. Or. ni dans cet auteur, ni dans ceux que Nust et Tryon, on ne trouve de *S. plure costata* Cpr. Il n'y a done point lieu de tenir compte de tous ces noms, et on doit réserver ce terme pour l'espèce que j'ai publiée sous ce nom en 1913 (*Jour. de conch.,* LXI, p. 97), pour remplacer celui de *S. multicostata* v. Koenen, préemplye par Sowerby dès 1844, il y a done lieu de proposer pour la Coquille Californienne le nom de *S. evicta* de Boury nov. sp. nom mut.

Shell resembles the ribbed upper portion of *O. wroblewskii* a good deal, but is smaller and more cylindrical, with eight varices. It has seven whorls without the nucleus, the varices are continuous up the spire, the interspaces smooth, the basal disk octohedral from the intersection of the ribs, somewhat concave, and relatively smaller than in *wroblewskii.* (Dall.)

E. evicta De Boury, 1919, takes the place of *O. pluricostata.*

Type in United States National Museum, No. 56054. Type locality, Neah Bay, Washington.

Range. Forrester Island, Alaska, to Magdalena Bay, Lower California.

Subgenus DENTISCALA De Boury, 1886

Epitonium crenimarginatum Dall, 1917

Proceedings of the United States National Museum, **53**:473.

This is larger, much stouter, spirally striated, with a convex smooth basal disk, the twelve axial ribs on the last two whorls obsolete on the sides of the whorls but coronating the suture. It has six or seven whorls without the nucleus, the varix at the aperture is heavy, and there is sometimes another heavy varix indicating a resting stage. This has been confused with *E. crenatoides* Carpenter, 1864, from the Gulf of California, which is rather small with a coarse spiral rib on the basal disk and has deep pits at the intersections of the nine axial ribs. Length, 16; diameter, 7 mm. (Dall.)

Type in United States National Museum, No. 111207. Type locality, La Paz, Lower California.

Range. Monterey, California, to Puerto Libertad, West Mexico.

Epitonium nesioticum Dall, 1917

Proceedings of the United States National Museum, **53**:473.

A smaller species, *E. nesioticum* Dall, was dredged in sixteen fathoms. It has twelve varices, rather feebly carried over the whorls and obsolete on the basal disk. Sharp spiral sculpture covers the surface and the terminal varix is heavy; there are six whorls, not including a smooth nucleus of a whorl and a half; the suture is markedly coronated by the ribs. Length, 10.5; diameter, 5 mm. (Dall.)

Type in United States National Museum, No. 56900. Type locality, off Catalina Island, in 16 fathoms.

Range. Known only from type locality.

Subgenus NODISCALA De Boury, 1889

Epitonium spongiosum Carpenter, 1864

Proceedings of the California Academy of Sciences, **3**:222. *Supplementary Report,* British Association for the Advancement of Science, 660.

O. t. turrita, parva, albida, marginibus spirae rectis; anfr. ix. subplanatis suturis impressis; costis undulantibus circ. xiii., plerumque (nisi ad suturas crenulatas) obsoletis; tota superficie lineis punctorum creberrimis spiralibus, punctis creberrimis, minutis, altissimis; cerca basim imperforatam costa antica latissima, spirali; apertura ovata, valde callosa; operculo aurantiaco, paucispirali. Long., 0.36; long. spir., 0.26; lat., 0.12 poll. (Carpenter.)

Like small, very slender granulata; surface riddled with deep punctures in spiral rows. (Carpenter.)

Type in California State Collection. Type locality, Monterey, California.

Range. Off Oregon coast in 50 fathoms, to Monterey, California.

Described as *Opalia spongiosa.*

Epitonium retiporosum Carpenter, 1864

Proceedings California Academy of Sciences, 3: 222. *Supplementary Report,* British Association for the Advancement of Science, 660.

O. t. *O. bullatae* forma simulante, sed sculptura omnino diversa; anfr. nucl. . . . . (decollatis); norm. vii. subrotundatis, suturis impressis; costis radiantibus rotundatis, subarcuatis, haud varicosis, circ. xiv., super suturas tenue continuis; anfr. ult. seriebus nodulorum spiralibus irregularibus, vice costarum, instructa, peripheria tuberculosa; tota superficie retiprosa, intertestiis alte interpunctatis, punctulis minutissimis, confertissimis; basi vix costata, a serie nodulorum angulata; apertura rotundata; peritremati continuo, varicoso; labro haud sinuato; operculo paucispirali. Long., 0.28; long. spir., 0.20; lat., 0.10 poll. (Carpenter.)

Sculpture in network with deep holes. (Carpenter.)

Type in California State Collection, No. 1014. Type locality, Catalina Island, California, in 40 fathoms.

Range. Catalina Island, California, to Gulf of California.

Subgenus Acirsa Mörch, 1857

Epitonium boreale (Beck) Lyell, 1839

Plate 31, fig. 4

The Rising of Sweden, 37; Pl. 2, figs. 11–12.

Shell white or pale flesh-color, elongated, turreted, acute; whorls ten, convex, with numerous revolving striae; the upper whorls with slight transverse undulations or faint costae, which are wanting on the lower ones; last whorl slightly carinated; aperture roundish, effuse, and slightly angulated in front. Length, 19; diameter, 6.5 mm. (Tryon, *American Marine Conchology.*)

Range. Aleutian Islands, Alaska; circumboreal.

Epitonium boreale ochotense Middendorff, 1849

Beitrage zu einer Malacologia Rossica, 2:98. *Sibirische Reise,* 213; Pl. 12, figs. 12–14.

Testa elongata, crassa, lactea, subdiaphana; anfractibus contiguis, vix convexitate prominentibus sulculis linearibus longitudinalibus confertim cinctis; caricibus plicatilibus, vix prominulis, aequalibus, confertis; anfractu ultimo basi angulato-carinato; suturis distinctis nec impletis; apertura basi ad columellam nonnihil producta, superius ad suturam angulato; peristomate subnullo, ad columellam callositate valde parca vic continuo. (Middendorff.)

Thick, white, subdiaphanous; whorls numerous, flatly convex, with irregular spiral impressed striae, and very irregular, thick, slightly oblique, low ribs. Length, 60 mm. (Tryon, *Manual of Conchology.*)

Type in Museum, St. Petersburg. Type locality, south coast of the Sea of Okhotsk.

Subgenus Boreoscala Kobelt, 1902

Epitonium greenlandicum Perry, 1811

Conchology; Pl. 28, fig. 8.

Shell of a pale brown, invested with thong-shaped ribs; the four upper folds of the spire smooth; the mouth round. (Perry.)

Type locality, Greenland.

Range. Arctic Ocean near Point Barrow and southward on the west to north Japan; on the east to Wrangell, Alaska; circumboreal. Fossil: Pliocene.

Subgenus Asperoscala De Boury, 1909

Epitonium bellastriatum Carpenter, 1864

Proceedings of the California Academy of Sciences, 3:221. *Supplementary Report,* British Association for the Advancement of Science, 660.

S. t. curta tenuissima, albida; anfr. vii. valde tumentibus, haud nisi per costas attingentibus; costis circ. xvii. acutis extantibus, reflexis, haud semper in spira attingentibus, postice angulatis, parum spinosis; interstitiis circa spiram basimque dense spiraliter lirulatis, lirulis rotundatis, super varicum angulum obsoletis; apertura ovata, umbilico magno. Long., 0.78; long. spir., 0.55; lat., 0.38 poll. (Carpenter.)

Shape like *pretiosa,* jun.; ribs very close, spinous at shoulder, crossed by spiral riblets. (Carpenter.)

Type in California State Collection, No. 393b. Type locality, Monterey, California.

Range. Monterey to San Diego, California.

Epitonium lowei Dall, 1906

Plate 31, fig. 1

Nautilus, **20**:44.

Shell small, conic, with five or more rapidly increasing whorls after the (lost) nucleus; color white, whorls very convex with deep sutures and a small, spiral umbilicus; there is no basal disk or cord; sculpture of about twenty-seven rather thick, strongly reflected, smooth, close-set varices, and very close, fine, spiral threads, covering the whorl between the varices, and separated by about equal sulci; aperture sub-circular, slightly higher than wide, the reflected margin wide at the outer lip, patulous at the inner base, narrow between the shoulder and the preceding whorl, and at the shoulder produced into a short, rather stout spine which, repeated on successive varices, coronates the whorls. Length of shell (without nucleus), 7.0; diameter, 4.0; maximum diameter of aperture, 2.5 mm. (Dall.)

Type in United States National Museum, No. 191548. Type locality, off Avalon, Catalina Island, California.

Range. Known only from type locality.

Epitonium cookeanum Dall, 1917

Proceedings of the United States National Museum, **53**:475.

Shell small, pink, solid, acute, imperforate, the nucleus lost, with eight, well-rounded, subsequent whorls; with ten, rather solid, smooth, continuous, white varices, making less than half a turn round the spire; spiral sculpture of extremely fine uniform threads covering the whorl between the varices; the terminal varix thicker than the others; all the varices broader at the intersection with the suture but not spinose. Length, 9.5; diameter, 4 mm. (Dall.)

Type in United States National Museum, No. 211019. Type locality, San Diego, California?

Range. San Diego, California, to Gulf of California.

Epitonium lagunarum Dall, 1917

Proceedings of the United States National Museum, **53**:477.

Shell small, thin, white, with six rounded whorls exclusive of the (lost) nucleus; varices sixteen, low, narrow, widely spaced, passing over the entire whorl; spiral sculpture of extremely fine striae, with a single thread on the periphery and a stronger one, marginating the imperforate base, on which the suture is laid; aperture obliquely ovate, the margin slightly produced in front and near the suture. Length, 7.5; diameter, 3.5 mm. (Dall.)

Type in United States National Museum, No. 253024. Type locality, Laguna Beach, California.

Range. Known only from type locality.

Epitonium arnoldi Dall, 1917

Proceedings of the United States National Museum, **53**:475.

Shell of moderate size, white, thin, with eight well-rounded whorls exclusive of the (lost) nucleus; varices on the last whorl thirteen; on the first four whorls they are feeble, on the next two distinct and crowded, on the last two more distinctly spaced, low, cord-like; spiral sculpture of extremely fine, close-set striae; terminal varix not enlarged, the varices not continuous over the suture, not enlarged or spinose; aperture obliquely ovoid. Length, 14; diameter, 5.5 mm. (Dall.)

Type in United States National Museum, No. 106875. Type locality, beach at San Pedro, California.

Range. Known only from type locality.

Subgenus Cirsotrema Mörch, 1852

Epitonium montereyense Dall, 1907

Nautilus, **20**:28.

Shell small (probably not full grown), the nucleus lost but with five subsequent rapidly increasing whorls; shell substance in two layers, the inner translucent white, solid, the outer opaque white, frothy, porous, with numerous puncticulations arranged in harmony with the incremental lines, except on the basal disk where they form spiral lines; varices low, solid, with a spongy surface, nine in number; basal disk conspicuous, slightly concave; bordered by a conspicuous cord; aperture gibbous, patulous near the imperforate axis. Long., 2.5; diameter, 1.5 mm. (Dall.)

Type in United States National Museum, No. 110431. Type locality, Del Monte, in Monterey Bay, in 25 fathoms.

Range. Monterey to San Pedro, California.

Subgenus Nitidoscala De Boury, 1909

Epitonium indianorum Carpenter, 1865

Annals and Magazine of Natural History, series 3, **15**: 31. Tryon, *Manual of Conchology,* **9**; Pl. 14, fig. 48.

S. testa gracili, turrita, alba; anfr. circ. x., rotundatis, parum separatis, laevibus; basi simplici, haud umbilicata; costis viii–xv (plerumque xii), acutioribus, subreflexis, interdum latis, plerumque lineis irregularibus margini spirae recto parellelis ascendentibus, rarius juxta suturam subnodosis; apertura ovata. Long., 1.05; long. spir., 0.08; lat., 0.36 poll. (Carpenter.)

Shell rather thin, white, whorls ten, rounded, scarcely in contact, with eight to fifteen (usually about twelve) lamellae, narrowly aculeated at the top of the whorls.

Type in United States National Museum. Type locality, Neah Bay.

Range. Forrester Island, Alaska, to Todos Santos Bay, Lower California. Fossil: Pleistocene—Santa Barbara, San Diego, San Pedro, California. Pliocene—San Pedro, California.

Described as *Scalaria.*

Epitonium tinctum Carpenter, 1865

Annals and Magazine of Natural History, series 3, **15**: 31. Tryon, *Manual of Conchology,* **9**; Pl. 14, fig. 49.

S. indianorum costis acutis, haud reflexis; anfractibus postice fuscopurpureo tinctis. (Carpenter.)

Costae acute, not reflected, whorls posteriorly tinged with brownish purple. (Tryon, *Manual of Conchology.*)

Type in United States National Museum. Type locality, Cedros Island, Lower California.

Range. Monterey, California, to Gulf of California.

Described as *Scalaria indianorum tincta.*

Epitonium subcoronatum Carpenter, 1866

Proceedings of the California Academy of Sciences, **3**:221.

S. t. compacta, haud elevata alba; anfr. x. rotundatis, parum attingentibus; costis circ. xiii acutissimis, expansis, vix reflexis, postice attingentibus, lineis margini spirae dextro parallelis spiram, ascendentibus, t. adolesc. postice vix coronatis, adulta simplicibus; apertura subcirculari, umbilico nullo; sculptura spirali nulla. Long., 0.45; long., spir., 0.29; lat., 0.22 mm. (Carpenter.)

Like young *communis,* with more and sharper ribs, faintly coronated when adolescent. (Carpenter.)

Type in California State Collection, No. 393a. Type locality, Monterey, California.

Range.. Vancouver Island to San Diego, California.

Described as *Scalaria subcoronata.*

Epitonium persuturum Dall, 1917

Proceedings of the United States National Museum, **53**:478.

Shell with three, smooth, brown, nuclear and five, subsequent, thin, white whorls separated by an unusually deep suture; varices ten, narrow, rounded, continuous up the spire which they encircle about half way, but not expanded at the suture into which they dip; the whorls are slightly flattened above the shoulder, but there is no corresponding angle or spine on the varices. Length, 15.5; diameter, 6 mm. (Dall.)

TYPE in United States National Museum, No. 211021. Type locality, beach at San Diego, California.

RANGE. Known only from type locality.

Epitonium fallaciosum Dall, 1917

Proceedings of the United States National Museum, **53**:487.

In 1856 Carpenter described from Panama a species of *Nitidoscala* with eight varices, under the name of *S. hindsii.* By some confusion he transferred the name in 1865 to a well-known form from California which has eleven to fourteen varices and ranges from Monterey to the Gulf of California, but so far as is known does not reach Panama. For this Californian shell I propose the name of *Epitonium fallaciosum.* (Dall.)

TYPE in United States National Museum. Type locality, Monterey, California.

RANGE. Monterey, California, to Gulf of California.

Epitonium hexagonum Sowerby, 1844

Proceedings, Zoölogical Society of London, 29. *Thesaurus Conchyliorum,* Part IV; Pl. 33, fig. 67.

Scal. testa brevi, laevi, imperforata; anfractibus contiguis, varicibus sex, crassis, prominentibus, ad apicem oblique continuis; apertura rotundata; colore albo.

A short, imperforate, white species, with whorls closely united and strong varices, forming about six oblique lines along the spire. (Sowerby.)

TYPE in cabinet of Mr. Cuming. Type locality, Acapulco, Mexico.

RANGE. Santa Cruz, California, to Panama.

Described as *Scalaria hexagona.*

Epitonium tiara Carpenter, 1856

Proceedings, Zoölogical Society of London, 164.

S. testa obesa, laevi, albida; anfr. vii parum attingentibus, rapide augentibus; costis xii acutis valde extantibus, infra suturam parum alatis, attingentibus, lineis rectis ad apicem continuis; umbilico nullo. Long., .27; long. spir., .16; lat., .16 poll. (Carpenter.)

Shell obese, smooth, whitish; with seven whorls, scarcely touching, increasing rapidly; with twelve acute costae standing out sharply; below the suture slightly winged, with straight lines continuing to the apex; no umbilicus. (Translation.)

TYPE in Museum Cuming. Type locality, Panama.

RANGE. Catalina Island, to Todos Santos Bay, Lower California, to Panama.

Epitonium columbianum Dall, 1917

Proceedings of the United States National Museum, **53**:481.

Shell acute, yellowish-white, with nine whorls exclusive of the (lost) nucleus; varices eighteen, low, rounded, more or less striated, without any angulation, continuous over the suture into which they dip and nearly encircling the spire; the type-specimen has the interspaces more or less finely axially striated, but the southern specimens seem quite smooth; base and aperture rounded, the anterior margin of the latter slightly angular. Length, 21; diameter, 7.5 mm. (Dall.)

TYPE in United States National Museum, No. 111211. Type locality, off the Columbia River, Oregon.

RANGE. Off the Columbia River, Oregon, to Gulf of California.

Epitonium sawinae Dall, 1903

Plate 31, fig. 2

Proceedings of the Biological Society of Washington, **16**:173. *Bulletin 112,* United States National Museum; Pl. 6, fig. 12.

Shell small, elongate, sub-acute, with ten or more whorls; nucleus of three smooth polished whorls; subsequent whorls smooth, with about nineteen low, sharp, slightly reflected varices, which entirely cross the whorl; at the shoulder these are slightly spinose; aperture rounded ovate entire, with a small spine at the shoulder angle and a less conspicuous one at the inner base of the aperture; there is no trace of a basal cord or disk, and no spiral sculpture. Length, 10.5; diameter of aperture, 2.5; maximum diameter of last whorl, 4.0 mm. (Dall.)

TYPE in United States National Museum, No. 109309. Type locality, near Avalon, Catalina Island.

RANGE. Monterey to Catalina Island, California, to off Coronado Islands, in 34 fathoms.

Described as *Scala sawinae.*

Epitonium densiclathratum Dall, 1917

Proceedings of the United States National Museum, **53**:478.

Shell white, solid, with six or eight well-rounded whorls exclusive of the (lost) nucleus; varices ten or eleven, sharply axially grooved on their anterior faces, solid, thick, not continuous over the suture, on the base showing a slight flattening, though there is no basal cord or disk; aperture ovate; behind the inner margin there is a narrow flattened area reflected over the umbilical region in the type-specimen. Length, 17; diameter, 7.5 mm. (Dall.)

Type in United States National Museum, No. 111209. Type locality, Puget Sound, Washington.

Range. Neah Bay, Washington, to San Diego, California.

Epitonium crebricostatum Carpenter, 1886

Proceedings of the California Academy of Sciences, **3**:222.

S. t. gracili, tenui, alba; anfr. x rotundatis, haud attingentibus; costis circ. xv, acutis, reflexis, vix attingentibus, lineis irregulariter spiralibus ascendentibus; costis juxta suturam eleganter coronatis; sculptura spirali, nisi striulis interdum exillimis, nulla; apertura rotundata; umbilico nullo; operculo normali, dense corneo. Long., 0.70; long. spir., 0.52; lat., 0.18 mm. (Carpenter.)

Shell slender, thin, white; with ten rotund whorls, scarcely touching; with about fifteen acute reflexed lines, scarcely touching each other, in regular ascending spirals; ribs near the suture elegantly carinate; no spiral sculpture except sometimes very thin striations; aperture rotund, no umbilicus. Operculum normal, densely horny. (Translation.)

Type in California State Collection, No. 393. Type locality, Monterey, California.

Range. Vancouver Island to Gulf of California.

Epitonium catalinense Dall, 1917

Proceedings of the United States National Museum, **53**:481.

Shell with a small three-whorled nucleus, smooth and white, and seven and a half subsequent whorls; varices twenty-two to twenty-four, not spinous or angular, not regularly continuous over the suture, with the anterior faces of the varices finely lamellose or deeply striated. Base rounded with a minute umbilical perforation in the adult; aperture nearly circular. Length, 13.5; diameter, 6 mm. (Dall.)

It differs from *sawinae* by the absence of angularity on the greater number of the varices, and by the umbilical perforation. (Dall.)

Type in United States National Museum, No. 109502. Type locality, Catalina Island, California.

Range. Known only from type locality.

Epitonium californicum Dall, 1917

Proceedings of the United States National Museum, **53**:482.

Shell small, white, solid, with seven whorls and a very small brownish nucleus of a whorl and a half; varices nine or ten, low, sharp, reflected, anteriorly axially striated, with a very small sharp spine at the shoulder; suture deep, the whorls almost separated, rounded; base rounded, imperforate; aperture short-ovate, its inner margin resting on the preceding varices, not touching the body of the whorl. Length, 10.5; diameter, 4 mm. (Dall.)

Type in United States National Museum, No. 201202. Type locality, San Miguel Island, California.

Range. San Miguel Island, California, to Gulf of California.

Epitonium caamanoi Dall and Bartsch, 1910

Plate 31, fig. 3

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N*:13; Pl. 1, fig. 1.

Shell small, rather conic, white, with thirteen broadly reflexed, axially conspicuously striated varices; nucleus lost(?); whorls, more than six, varices continuous up the spire, narrow near the suture, more than doubling in width at the shoulder, where they are provided with a small spine or prominent angulation, then continuing to the base, where they are again narrowly contracted; there is no basal cord or disk, the umbilicus is closed; the surface of the whorls between the varices is smooth; the whorls are evenly rounded, and the aperture, if perfect, would probably be nearly circular. Length of six whorls (decollate) 9.5; diameter at base, 5.0; at decollation, 0.7; of aperture, 2.0 mm. (Dall and Bartsch.)

Type in Ottawa? Type locality, Barkley Sound, Vancouver Island, British Columbia.

Range. Vancouver Island to San Pedro, California.

Epitonium rectilaminatum Dall, 1907

Nautilus, **20**:127. *Proceedings of the United States National Museum,* **53**:482.

Shell very similar to *S. berryi,* with the same number of whorls and varices, but having the nuclear shell smaller, the test less heavy, the varices nearly vertical to the surface of the whorl, instead of reflected which makes them appear sparser, though really the same number occur on the whorl; the varices are narrower and the peristome less heavy and wide. Length, 3.25; max. diameter, 1.6 mm. (Dall.)

TYPE in United States National Museum, No. 110430. Type locality, Monterey, California.

RANGE. Monterey, California, to Gulf of California.

Epitonium berryi Dall, 1907

Nautilus, **20**:127.

Shell small, white, six-whorled; nuclear whorls polished, smooth, without varices; later whorls with rather strong, reflected, faintly axially striated varices, on the last whorl about twenty or twenty-one in number; these varices are quite close-set, not angulated in front of the suture and markedly reflected, with the interspaces smooth; base with no basal disk or cord, the coil imperforate, the peristome rather callous on the pillar side. Long., 3.5; diameter, 1.75 mm. (Dall.)

TYPE in United States National Museum, No. 107724. Type locality, San Pedro Bay, California, in 200 fathoms.

RANGE. Monterey to San Diego, California.

Epitonium inconspicuum Sowerby, 1847

Thesaurus Conchyliorum, **1**:90; Pl. 33, fig. 53.

T. *Sc. irregulari* similima sed varicibus magis numerosis, umbilico minori; labio interno antice sub-angulato.

The ribs are exceedingly numerous, regular and fine; the umbilicus is smaller than in *Sc. irregularis,* which it otherwise resembles, and the inner lip is reflected at the lower or anterior part in the form of an angle. (Sowerby.)

Shell minute, white, short, ventricose, umbilicated, spire pyramidal, whorls few, rounded; varices numerous, very thin, oblique; aperture subquadrate, scarcely angular above, inner lip angular at the base by the columella. (*Conchologica Iconica.*)

TYPE in British Museum. Type locality given as West Indies, by both Sowerby and Reeve.

RANGE. Off San Diego, California, in 75 fathoms.

Epitonium diegensis Dall, 1917

Proceedings of the United States National Museum, **53**:483.

Shell minute, whitish, with five whorls exclusive of the (defective) nucleus; varices eleven to twelve, sharply anteriorly striated, angular at the shoulder, continuous over the suture, and making about half the circuit of the spire; base rounded, imperforate; aperture subovate, the reflected margin angular at the shoulder. Length, 5; diameter, 2 mm. (Dall.)

Type in United States National Museum, No. 211904. Type locality, San Diego, California.

Range. San Diego, California, to Gulf of California.

Epitonium regiomontanum Dall, 1917

Proceedings of the United States National Museum, **53**:481.

Shell small, white, rather solid, with six whorls, exclusive of the (lost) nucleus; varices fourteen, low, rather solid, striated, not angulated, largely continuous over the suture, encircling about one-fourth of the spire, widely flatly reflected on the base, the reflection covering at least half the interspace, the whole giving the effect of a disk though there is no basal disk or cord; aperture subovate, the anterior margin somewhat produced. Length, 6; diameter, 2.5 mm. (Dall.)

Type in United States National Museum, No. 111217. Type locality, Monterey Bay in 30 fathoms.

Range. Known only from type locality.

Described as *Epitonium montereyense* in 1917.

SECTION CRISPOSCALA De Boury, 1909

Epitonium regum Dall, 1917

Proceedings of the United States National Museum, **53**:484.

Shell small, whitish, acute, with three smooth nuclear and seven or more subsequent whorls; varices nineteen to twenty, strongly anteriorly striated, narrowly flatly reflected, continuous over the suture and making about half the circuit of the spire, the anterior faces of the varices slightly irregularly crenulated; they are sharply angulated at the shoulder, giving the profile a turriculate aspect; base rounded, imperforate; aperture rounded, the reflected margin narrow. Length of five whorls, 9; maximum diameter, 4; diameter at decollation, 0.8 mm. (Dall.)

This species is of the same general type as *E. catalinae,* but has more numerous and less expanded varices, which are obsoletely crenated. (Dall.)

Type in United States National Museum, No. 206596. Type locality, off Point Reyes in 61 fathoms.

Range. Point Reyes to San Diego, California.

Epitonium acrostephanum Dall, 1908

Proceedings of the United States National Museum, **34**:251.

Shell slender, acute, turreted, with two nuclear and nine or more subsequent whorls which are in contact, though separated by a deep suture across which the varices are continuous; axial sculpture of (on the last whorl, fourteen) nearly vertical, thin, sharp, slightly reflected varices, which are expanded near the suture into a small lamella of which the posterior corner, when intact, bears a small sharp spine, behind which the varix is much attenuated and turns into the suture, which it crosses and becomes connected with one of the varices of the preceding whorl; anterior face of the varices is concentrically sharply striate, and the portion which approaches the center of the base is slightly flattened, although there is no basal disk or perforation; the space between the varices is smooth and polished, but under a lens shows traces of faint spiral striation, more or less irregular; the aperture is rounded-ovate, the peritreme thin and like the preceding varices; the operculum is thin, of about three whorls, concave and centrifugally striated, of a pale horn color. Height, of shell, 20; of last whorl, 8.5; of peritreme, 4.5; maximum diameter, 6.5 mm. (Dall.)

TYPE in United States National Museum, No. 110638. Type locality, Monterey, California.

RANGE. Monterey, California, to Coronado Islands.

Epitonium catalinae Dall, 1908

Proceedings of the United States National Museum, **34**:252.

Shell slender, white, turreted, imperforate, with more than seven adherent whorls; nucleus (lost); suture distinct, closed; varices (on the last whorl, fourteen) continuous, making nearly one revolution around the axis in ascending the spire; they are flatly reflected, axially striate, subspinose at the shoulder, giving a tabulate aspect to the rounded whorls. There is no basal disk on the whorl, but on the basal part of each reflection of the varics there is a smooth area over which the suture travels, and which, taken collectively, gives the effect of segments of a disk imposed on the varices but not on the whorl; below the shoulder the varices are widely reflected, extending for a space to the angle of reflection of the preceding varix, where it would seem these extensions are normally attached, covering a hollow space between them and the whorl, but in the type-specimen most of these extensions are broken away; aperture subcircular. Height, of (decollate) six whorls, 12.0; of last whorl, 6.0; of aperture, 2.7; maximum diameter, 4.5 mm. (Dall.)

TYPE in United States National Museum, No. 198628. Type locality, south side of Catalina Island, California.

RANGE. Forrester Island, Alaska, to San Diego, California.

Epitonium tabulatum Dall, 1917

Proceedings of the United States National Museum, **53**:482.

Shell slender, acute, thin, dull white, with two and a half smooth nuclear and twelve or more subsequent whorls; varices sixteen, thin, sharp, well-reflected, anteriorly striated, with a blunt angle at the shoulder, behind which the varix is somewhat concave, giving a tabulate profile to the whorls; the varices more than half encircle the spire, being continuous over the spire; in perfect specimens there is a very thin calcareous outer layer to the shell; base rounded, aperture rounded, the reflected margin narrow. Length, 18; diameter, 7.5 mm. (Dall.)

TYPE in United States National Museum, No. 109569. Type locality, San Pedro, California.

RANGE. San Pedro, California, to Coronado Islands.

SECTION GLOBISCALA De Boury, 1909

Epitonium orcuttianum Dall, 1917

Proceedings of the United States National Museum, **53**:484.

Shell small, white, acute, with two smooth, short, nuclear and six subsequent whorls; varices ten to twelve, narrow, erect, with a narrow reflection and an angle or even a small spine at the shoulder, not continuous over the suture, the anterior surface smooth, the base imperforate. Length, 6.5; diameter, 3 mm. (Dall.)

TYPE in United States National Museum, No. 273998. Type locality, San Diego Harbor, California.

RANGE. Known only from type locality.

Epitonium zephyrium Dall, 1917

Proceedings of the United States National Museum, **53**:485.

Shell white, polished, solid, conic, with about five whorls exclusive of the (lost) nucleus; varices, nine, low, continuous, and bridging the suture, encircling about one-third of the spire in ascending to the apex, with smooth interspaces; varices smooth in front and without spines or angulation; base rounded, imperforate, without disk or cord; aperture subovate with narrow margin somewhat expanded in front and at the suture. Length, 11.5; diameter, 6 mm. (Dall.)

Type in United States National Museum, No. 56056. Type locality, San Diego, California.

Range. Known only from type locality.

Epitonium barbarinum Dall, 1919

Proceedings of the United States National Museum, **56**:341.

Shell small, imperforate, white, with eleven varices continuous up the spire which they one-third encircle; anterior surface of the varices flattish, smooth; the shoulder is not angular or spinose; there are six whorls exclusive of the (lost) nucleus; suture deep; base rounded without a basal cord or disk; aperture subovate, the inner lip thickened. Height of shell, 19; of last whorl, 7.5; of aperture, 4; diameter, 6.5 mm. (Dall.)

Type in United States National Museum, No. 46229. Type locality, San Diego, California.

Range. San Diego, California, to Panama.

Family JANTHINIDAE

Genus **JANTHINA** Bolten, 1798

Shell thin, translucent, trochiform; nucleus minute, styliform; sinistral; whorls few, rather ventricose; aperture four-sided; columella tortuosus; lip thin, notched at the outer angle. Base of the shell deep violet, spire nearly white. (Tryon, *Structural and Systematic Conchology.*)

Type. *Janthina communis* Lamarck.

Distribution. Atlantic and Pacific Oceans.

Janthina globosa Swainson, 1822

Zoölogical Illustrations, Series I, **2**: Pl. 85.

I. testa ventricosa, basi producta; apertura longiore quam latiore; labio exteriore laviter emarginato.

Shell ventricose, the base lengthened; aperture longer than broad; outer lip slightly emarginate. (Swainson.)

Diameter, 1.5 in. (Tryon, *Manual of Conchology.*)

Type in British Museum? Type locality not known to writer.

Range. Puget Sound to Gulf of California. Pelagic.

Janthina exigua Lamarck, 1822

Histoire naturelle des animaux sans vertebres, Series I, **6**: 206. Tryon, *Manual of Conchology,* **9**: 37; Pl. 10.

Ianth. testa conico-turbinata, spira elata, suturis impressis, apice acuta, anfractibus rotundatis, concentrice lamellato-corrugatis, rugis medio sinuatis; intense violacea, pellucida; columella breviuscula, parum reflexa; apertura parva, medio emarginata.

Shell conically turbinated, spire raised, with the sutures impressed, sharp at the apex; whorls rounded, concentrically lamellately wrinkled, wrinkles sinuated in the middle; deep-violet, transparent; columella rather short, but reflected; aperture small, notched in the middle. (*Conchologica Iconica.*)

Type locality, Cornwall.

RANGE. Catalina Island, California, to West Mexico. Fossil: Pelagic.

Janthina ceruleata Reeve, 1858

Conchologica Iconica, Janthina; fig. 7.

Ianth. testa depresso-turbinata, spira parva, anfractibus declivi-convexis, oblique subrude plicato-striatis, spiraliter dense minute malleato-striatis; intense caeruleo-violacea, versus apicem albicante, fascia lata pallida circa columellam; columella subrecta, appresso-reflexa; apertura transversa, medio sinuata.

Shell depressly turbinated, spire small, whorls slopingly convex, obliquely rather rudely plicately striated, spirally densely minutely indentedly striated; deep blue-violet, whitish toward the apex, with a broad pale band round the columella; columella nearly straight, appressly reflected; aperture transverse, sinuated in the middle. (Reeve.)

TYPE in Museum Cuming. Type locality, San Diego, California?

RANGE. Known only from type locality.

Family MELANELLIDAE

Genus **MELANELLA** Bowdich, 1822[1]

The genus as here constituted embraces the white polished mollusks that have the last whorl produced and the inner lip appressed for its entire length, or at least for the greater part of its length, to the attenuated base. The shells may be straight or flexed. (Bartsch.)

TYPE. *Melanella dufresnii* Bowdich.

DISTRIBUTION. Europe and on the Pacific coast of North America, Aleutian Islands, Alaska, to Gulf of California; also Cerros Islands and Galapagos Islands. Fossil: Upper and Lower San Pedro Series, Santa Monica to Point Abreojos, Lower California.

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[1] For description of new species received while this volume was in press, see Appendix, p. 280.

SECTION MELANELLA s.s.

Melanella montereyensis Bartsch, 1917

Plate 39, fig. 6

Proceedings of the United States National Museum, 53:320; Pl. 39, fig. 6.

Shell broadly conic, falcate, flexed to the right, bluish-white, with a series of opaque areas, marking varical streaks. Early whorls well-rounded, the later ones slightly rounded, a little more so on the convex than the concave side. Sutures scarcely marked. The posterior determination on the inside of the turns shines through the substance of the shell and appears as a conspicuous false suture. Periphery weakly angulated. Base short, very strongly curved on the left side. Aperture short, broadly oval; posterior angle acute, outer lip quite strongly protracted at the periphery, inner lip oblique, curved, reflected and appressed to the base; parietal wall covered by a thick callus. Length, 5; diameter, 2.2 mm. (Bartsch.)

Type in United States National Museum, No. 181307. Type locality, Monterey, California.

Range. Trinidad to Monterey, California.

Melanella peninsularis Bartsch, 1917

Plate 39, fig. 4

Proceedings of the United States National Museum, 53:320; Pl. 39, fig. 4.

Shell elongate-conic, very slightly curved, polished, surface marked by exceedingly fine lines of growth and exceedingly regular, very fine microscopic, spiral striations; bluish-white, except where the animal shines through the substance of the shell, when it appears brown. Whorls separated by a very poorly defined suture, which is inconspicuous compared to the false suture caused by the base of the preceding whorl shining through the substance of the succeeding turn. The whorls are marked at irregular intervals by thickened varices, which are very prominent. Periphery of the last whorl well-rounded. Base short, slightly rounded, the left side sloping very obliquely. Aperture broadly oval; posterior angle acute, outer lip decidedly protracted halfway between the posterior angle and the base; inner lip very oblique, moderately strong, slightly curved, reflected over and appressed to the base; parietal wall covered with a thick callus. Length, 5.2; diameter, 2.2 mm. (Bartsch.) (Bartsch.)

Type in United States National Museum, No. 251264. Type locality, Lower California.

Range. San Diego, California, to Magdalena Bay, Lower California.

Melanella lastra Bartsch, 1917

Plate 42, fig. 3

Proceedings of the United States National Museum, **53**:321; Pl. 40, fig. 3.

Shell small, conic, only very slightly flexed; bluish-white, semitranslucent; polished, marked by exceedingly fine lines of growth only. The first three whorls well-rounded, separated by a well-impressed suture, the rest very slightly rounded, with a scarcely defined suture. Periphery well-rounded. Base short, well-rounded. Aperture very broadly oval; posterior angle acute; outer lip decidedly protracted a little anterior to the middle; inner lip short, curved, reflected over and appressed to the base; parietal wall covered with a thick callus. This species is similar to *M. peninsularis,* but is uniformly more slender, with the varices much less conspicuously marked. The type, an adult shell, which has lost probably the first two whorls, retaining eight, measures: length, 4.1; diameter, 1.6 mm. (Bartsch.)

Type in United States National Museum, No. 105519. Type locality, Point Abreojos, Lower California.

Range. San Pedro, California, to Magdalena Bay, Lower California.

Melanella thersites Carpenter, 1864

Plate 47, fig. 2

Supplementary Report, British Society for the Advancement of Science, 286, 659. *Proceedings of the United States National Museum,* **53**; Pl. 41, figs. 1, 2, 3.

E. testa parva, curtissima, albida, arcuata, valde distorta; marginibus spirae dextro subrecto, sinistro valde excurvato; anfr. nucl.? . . . . (decollatis); norm. vi., laevibus, subplanatis, suturis distinctis; basivalde arcuata; apertura subovali, dextrorsum producta; peritremate continua, valde callosa; labro sinuato. Long., .21; long. spir., .13; lat., .09 poll. (Carpenter.)

Shell broadly conic, rather stout and heavy, polished, shining, usually flexed in one direction only, though sometimes in two. Whorls rather strongly rounded, marked by exceedingly fine incremental lines and irregularly scattered varices only. Sutures strongly marked. Periphery of the last whorl somewhat inflated, well-rounded. Base short, well-rounded. Aperture oval; posterior angle acute; outer lip thick within, sharp at the edge, and decidedly protracted a little anterior to the middle; inner lip stout, slightly curved, the posterior half reflected over and appressed to the base. Parietal wall covered by a very thick callus which renders the peritreme complete. Type has lost the earlier whorls; the remaining measure: length, 5.1; diameter, 2.5 mm. (Bartsch.)

TYPE in United States National Museum, No. 11795. Type locality, Santa Barbara, California.

RANGE. Monterey, California, to San Geronimo Island, Lower California.

It is *Eulima bistorta* Vanatta and *Eulima lowei* Vanatta.

Melanella columbiana Bartsch, 1917

Plate 47, fig. 5

Proceedings of the United States National Museum, 53:324; Pl. 41, fig. 5.

Shell large, rather stout, polished, with a double flexure; when viewed with the aperture to the front it shows the early whorls bent backward and the succeeding turns flexed to the right. Shell bluish-white, except where the dried animal shines through its substance; there is a granular, light-brown to buff appearance. First three turns well-rounded, separated by a well-marked suture, the remaining turns slightly rounded with scarcely defined suture. The posterior termination of the whorl shines through the shell and appears as a conspicuous false suture. Surface marked by fine lines of growth only. Periphery of the last whorl weakly angulated. Base strongly rounded on the left side. Aperture very oblique, ovate; posterior angle acute; outer lip short, curved, slightly sinuous, reflected over and appressed to the base; parietal wall covered by a thick callus. Length, 9.5; diameter, 3 mm. (Bartsch.)

TYPE in United States National Museum, No. 207771. Type locality, Departure Bay, British Columbia.

RANGE. Baranoff Island, Alaska, to Departure Bay, British Columbia.

Melanella comoxensis Bartsch, 1917

Plate 47, fig. 4

Proceedings of the United States National Museum, 53:325; Pl. 41, fig. 4.

Shell broadly conic, with a double flexure, the early portion being turned back while the later is turned to the right; bluish-white, polished. First two whorls well-rounded, separated by a constricted suture, the rest slightly rounded, a little more so on the convex than the concave side, marked by exceedingly fine lines of growth and microscopic spiral striations and occasional varicial streaks, which appear as an opaque spot in the shell. Suture scarcely defined. The posterior limit of the inside of the whorls shines through the substance of the shell and appears as a false suture. Periphery of the last whorl slightly angulated. Base short, strongly rounded. Aperture broadly oval, rather short; posterior angle acute; outer lip protracted at the periphery; inner lip short, slightly curved, strongly reflected and appressed to the base; parietal wall covered with a thick callus. Length, 7.1; diameter, 3 mm. (Bartsch.)

Type in United States National Museum, No. 207773. Type locality, Comox, British Columbia.

Range. Known only from type locality.

Melanella macra Bartsch, 1917

Plate 47, fig. 6

Proceedings of the United States National Museum, **53**:326; Pl. 41, fig. 6.

Shell of moderate size, slender, with a double flexure. When viewed with the aperture to the front, it shows the early whorls bent backward and the succeeding turns flexed to the right. Shell bluish-white, except where the dried animal shines through its substance; there is has a granular light-brown to buff appearance. First four whorls well-rounded, with well-impressed suture, the remainder almost flattened, marked by exceedingly fine lines of growth only, and separated by a scarcely visible suture. The posterior limit of the inside of the whorls shines through the substance of the shell and appears as a conspicuous false suture. Periphery of the last whorl weakly angulated. Base somewhat prolonged, well-rounded. Aperture long, ovate; posterior angle acute; outer lip considerably protracted, particularly so at the periphery; inner lip stout, curved, reflected over and appressed to the base; parietal wall covered by a thick callus. Length, 7.5; diameter, 1.9 mm. (Bartsch.)

Type in United States National Museum, No. 207772. Type locality, Departure Bay, British Columbia.

Range. Departure Bay, British Columbia, to Seattle, Washington.

Melanella berryi Bartsch, 1917

Plate 45, fig. 3

Proceedings of the United States National Museum, **53**:326; Pl. 42, fig. 3.

Shell elongate-conic, with a double flexure; the first bend when the specimen is viewed with the aperture to the front, is to the right, and the second flexure is backward. The clean shell is bluish-white, but when the animal has been allowed to dry in it, it appears brown. The first two turns well-rounded, separated by a constricted suture, the remainder flattened, marked by exceedingly fine lines of growth and very fine microscopic spiral striations. Sutures scarcely preceptible. The posterior limit of the inside of the whorls appears through the mass of the shell as a false suture. Periphery of the last whorl well-rounded. Base short, somewhat inflated anteriorly. Aperture oblique, broadly oval; posterior angle very acute; outer lip strongly protracted between the base and the posterior angle, the greatest extension falling at the periphery; inner lip oblique, slightly sinuous, reflected over and appressed to the base; parietal wall covered with a strong callus. Length, 6; diameter, 2 mm. (Bartsch.)

TYPE in United States National Museum, No. 216820. Type locality, off Del Monte, Monterey, California.

RANGE. Monterey Bay to Catalina Island, California.

Melanella grippi Bartsch, 1917

Plate 45, fig. 5

Proceedings of the United States National Museum, 53:327; Pl. 42, fig. 5.

Shell elongate-conic, moderately stout, double flexed; the anterior portion is turned to the right, while the tip is bent backward; polished, marked by exceedingly fine lines of growth only; milk-white, except where the dried animal shines through the texture of the shell where it appears yellowish-brown, or where varices cross the whorls, behind which there is always an opaque area. First five whorls well-rounded, separated by a somewhat constricted suture, the remaining, moderately rounded, a little more so on the convex side than the concave. Summit of the whorls appressed, separated by a very ill-defined suture. The posterior termination shows conspicuously through the substance of the shell on the inside of the whorls and appears as a false suture. Last whorl somewhat inflated. Periphery moderately protracted. Base rounded. Aperture ovate; posterior angle acute; outer lip protracted at the periphery; inner lip short, slightly curved, reflected and appressed to the base; parietal wall covered by a moderately thick callus. Length, 8; diameter, 2.6 mm. (Bartsch.)

TYPE in United States National Museum, No. 203665. Type locality, Newport, California.

RANGE. San Pedro, California, to Point Abreojos, Lower California.

Melanella catalinensis Bartsch, 1917

Plate 42, fig. 7

Proceedings of the United States National Museum, 53:329; Pl. 40, fig. 7.

Shell elongate-conic, slender, doubly flexed, the main flexure being turned to the right, while the extreme tip is slightly bent backward; bluish-white, polished. First two whorls well-rounded, separated by a well-constricted suture, the rest moderately rounded on the convex, and slightly so on the concave side of the spire, separated by a scarcely defined suture. The posterior limit of the whorls shines through the substance of the shell and appears as a conspicuous false suture. Periphery of the last whorl slightly angulated. Base moderately produced, well-rounded. Aperture oval; posterior angle acute; outer lip produced at the periphery; inner lip somewhat sinuous, very oblique, slightly reflected and appressed to the base; parietal wall covered with a thick callus. Length, 5.2; diameter, 1.6 mm. (Bartsch.)

Type in United States National Museum, No. 173802. Type locality, Catalina Channel, dredged.

Range. Santa Rosa Island, California, to San Hipolito Point, Lower California.

SECTION EULIMA Risso, 1826

Melanella micans Carpenter, 1864

Supplementary Report, British Association for the Advancement of Science, 659. *Proceedings,* Philadelphia Academy of Natural Sciences, 63, 1865. *Proceedings of the United States National Museum,* **53**; Pl. 34, figs. 1–6.

E. t. *E. politae* simillima, sed minore; anfr. nucleosis stylinis, apice subdecliviter sito; anfr. normalibus xii, omnino planatis, maxime nitentibus, suturis nulis; albida, rosacea tincta; basi arcuatim rotundata; apertura ovali; labro postice, et paullum antice sinuato, calloso; labio calloso, columella vix torta. Long., .52; long. spir., .36; lat., .16 poll. (Carpenter.)

Shell straight, elongate-conic, bluish-white when the animal has been removed. When the animal has been allowed to dry in the shell, it appears through the substance of the shell and gives it a mottled brownish aspect. The brownish coloration when present usually extends over the upper half of the specimen. Whorls flattened, decidedly appressed at the summit. Sutures appearing as a very fine impressed line. Base moderately long, well-rounded. Aperture oval; posterior angle very acute; outer lip thin at the edge, bent back immediately below the summit, then forward to form a claw-shaped element, the center of which coincides with the periphery; there is another backward deflection of the outer lip at its junction with the inner lip, which is moderately strong, curved and twisted and partly reflected over and adnate to the base; parietal wall covered with a moderately thick callus. (Bartsch.)

Type in United States National Museum, No. 14850. Type locality, San Pedro, California.

Range. Vancouver Island to Point Abreojos, Lower California.

Fossil: Upper San Pedro Series—Santa Monica, to Spanish Bight, San Diego; Lower San Pedro Series—Cerritos, Deadman Island, and San Pedro, California.

Described as *Eulima micans.*

Melanella micans borealis Bartsch, 1917

Plate 46, fig. 7

Proceedings of the United States National Museum, **53**:305; Pl. 35, fig. 7.

From Vancouver north we have a race of *M. micans* which is uniformly more slender than the race to the south. This may have the subspecific name applied to it above. Length, 11.3; diam., 3.3 mm. (Bartsch.)

Type in United States National Museum, No. 150954. Type locality, Comox, Vancouver Island, British Columbia.

Range. Kodiak Island, Alaska, to Vancouver Island, British Columbia.

Melanella rutila Carpenter, 1864

Plate 46, figs. 2, 3, 6

Supplementary Report, British Association for the Advancement of Science, 359. *Proceedings of the California Academy of Sciences,* **3**:221. *Proceedings of the United States National Museum,* **53**; Pl. 35, figs. 2, 3, 6.

Eu. t. *Eu. micante* jun. simili, sed magis terti; valde nitente, rosaceo et livido tincta; anfr. nucl. ut in *Eu. micante;* norm. x. elongatis, gracillimis; basi, supra suturam retrorsum; columella magis torta; labro valde sinuato, supra suturam retrorsum calloso; labio angusto. Long., 0.26; long. spir., 0.19; lat., 0.07. (Carpenter.)

Shell of medium size, elongate-conic, slender, straight, surface polished, glossy without perceptible sculpture, excepting irregularly distributed varices. Whorls appressed at the summit to such an extent that the suture is scarcely perceptible; the basal portion of the preceding whorls shining through the substance of the succeeding turns as a false suture; the true suture appearing about one-third of the way between the summit and the false suture above the latter. Periphery of the last whorl rounded, base sloping in such a way as to lend the left outline a somewhat flattened appearance. Aperture large oval; posterior angle acute; outer lip decidedly protracted between the base and the posterior angle, forming a claw-like extension; inner lip short, moderately stout, somewhat curved, reflected over and appressed to the base; parietal wall covered with a moderately thick callus. (Bartsch.)

Type in United States National Museum, No. 14928. Type locality, Monterey, California.

Range. Vancouver Island, British Columbia, to Magdalena Bay, Lower California.

Fossil: Upper San Pedro Series—Santa Monica, Cerritos, San Pedro, San Diego, to Station 7498, San Quentin, Lower California; Lower San Pedro Series—Sand Rock, Deadman Island, San Pedro, California.

Described as *Eulima rutila.*

Melanella oldroydi Bartsch, 1917

Plate 41, figs. 5, 6, 7

Proceedings of the United States National Museum, 53:309; Pl. 36, figs. 5, 6, 7.

Shell rather broadly elongate-conic, bluish-white, in the living form, yellowish-white in the fossil, polished, marked by exceedingly fine lines of growth only. The first three whorls well-rounded, separated by a moderately impressed suture; the succeeding flattened, separated by a feebly defined suture. Periphery of the last whorl weakly angulated. Base short, well-rounded. Aperture oval; posterior angle acute; outer lip angulated at the junction with the basal lip and slightly protracted at the angle; inner lip short, curved, strongly reflected and appressed to the base posteriorly; parietal wall covered with a thick callus. Length, 9.2; diameter, 3 mm. (Bartsch.)

Type in United States National Museum, No. 109641. Type locality, San Pedro, California.

Range. San Pedro, California, to Point Abreojos, Lower California. Fossil: Pliocene and Pleistocene—Santa Monica to San Quentin, and Sand Rock, Deadman Island, San Pedro.

Melanella randolphi Vanatta, 1899

Plate 40, fig. 4

Proceedings, Philadelphia Academy of Natural Sciences, 256; Pl. 11, figs. 13, 14, 1899.

Shell smooth, rather slender, shining, bluish-white when empty, but when the animal is dried in, the spire is orange-colored above, pink in the middle, with sometimes a slight yellowish band on the body whorl; opaque; outlines of the spire straight, conical. Apex blunt, rounded, of moderate size, suture impressed; no varices. Seven or eight whorls, the body whorl ovate, whorls of the spire a little convex. Aperture ovate, outer lip sloping to the right, nearly straight, in profile it is moderately arched forward below and sometimes retracted very slightly above. Columella slender, concave below; above, forming an angle with the convex parietal wall; parietal callus very thin. Alt., 6; diameter, 2.3; length of aperture, 2.1; breadth, 1.1; diameter of apex, 3 mm. (Vanatta.)

Type in Philadelphia Academy of Natural Sciences, No. 73729. Type locality, Unalaska, Alaska, under stones.

Range. Aleutian Islands to Puget Sound, Washington.

Melanella californica Bartsch, 1917

Plate 40, fig. 1

Proceedings of the United States National Museum, 53:313; Pl. 37, fig. 1.

Shell elongate-conic, straight, polished, marked by exceedingly fine lines of growth and scarcely perceptible microscopic spiral striations, bluish-white, except where the dry animal shines through the texture of the shell, where it lends this a rosy flush. Whorls moderately rounded, separated by a slightly constricted suture. Periphery of the last whorl well-rounded. Base moderately long, well-rounded. Aperture elongate oval; posterior angle acute; outer lip drawn forward between the posterior angle and the base; inner lip slightly curved and partly appressed to the base; parietal wall covered by a thin callus. Length, 6.2; diameter, 2.3 mm. (Bartsch.)

TYPE in United States National Museum, No. 56911. Type locality, Catalina Island, California.

RANGE. Catalina Island to San Martin, California.

Melanella hemphilli Bartsch, 1917

Plate 40, fig. 6

Proceedings of the United States National Museum, **53**:313; Pl. 37, fig. 6.

Shell straight, stout, elongate-conic, polished, marked by exceedingly fine lines of growth and scarcely perceptible microscopic spiral striations, the two forming an exceedingly fine and very regular incised grating on the surface; bluish-white. Whorls moderately rounded, very slightly constricted at the sutures. Periphery of the last whorl well-rounded. Base moderately long, but somewhat inflated, well-rounded. Aperture small, oval; posterior angle acute; outer lip thin at the edge, which is scarcely at all drawn forward between the posterior angle and the base. Parietal wall covered with a thick callus. Length, 8.3; diameter, 3 mm. (Bartsch.)

TYPE in United States National Museum, No. 106514. Type locality, Point Abreojos, Lower California.

RANGE. San Diego, California, to Point Abreojos, Lower California.

Melanella compacta Carpenter, 1864

Plate 40, fig. 3

Supplementary Report, British Association for the Advancement of Science, 659. *Proceedings of the California Academy of Sciences,* **3**:221. *Proceedings of the United States National Museum,* **53**; Pl. 37, fig. 3.

Eu. t. *Eu. micanti* jun. simili, sed multo minus terti; marginibus spirae parum excurvatus; anfr. nucl. ? . . . . (detritis), norm. vii; basi et apertura elongatis; labro parum sinuato. Long., 0.25; long. spir., 0.15; lat., 0.09 poll. (Carpenter.)

Shell broadly elongate-conic, straight, polished, the surface marked by exceedingly fine lines of growth and scarcely perceptible microscopic spiral striations. Whorls flattened, separated by a scarcely defined suture; in fact, the basal portion of the preceding whorl shines through the substance of the succeeding turn and causes it at this point to appear as the suture. Periphery of the last whorl well-rounded. Base moderately long, well-rounded. Aperture quite long, oval, posterior angle acute; outer lip thin, protracted a little anterior to the middle between the posterior angle and the base; inner lip slightly curved, rather thick, reflected over and appressed to the base; parietal wall covered by a moderately strong callus. (Bartsch.)

Type in United States National Museum, No. 13517b. Type locality, San Pedro, California.

Range. San Pedro, California, to Point Abreojos, Lower California.

Melanella tacomaënsis Bartsch, 1917

Proceedings of the United States National Museum, 53:316; Pl. 38, fig. 5.

Shell small, straight, broadly elongate-conic, bluish-white, except where the animal shines through, there it appears golden brown; surface marked by exceedingly fine lines of growth and almost invisible microscopic spiral striations. Whorls flattened, separated by a scarcely defined suture; the basal portion of the preceding whorl shining through the substance of the succeeding turn appears as a conspicuous false suture. Periphery obscurely angulated; base short, flattened, the left margin very obliquely sloping. Aperture moderately large; posterior angle acute; outer lip very thick within, thin at the edge, decidedly protracted a little anterior to the middle between the posterior angle and the base; inner lip very stout, somewhat flexuose, reflected over and appressed to the base; parietal wall covered with a thick callus. Length, 5; diameter, 2.1 mm. (Bartsch.)

Type in United States National Museum, No. 159268. Type locality, Tacoma, Washington.

Range. Known only from type locality.

Subgenus SABINELLA Monterosato, 1890

Melanella bakeri Bartsch, 1917

Proceedings of the United States National Museum, 53:334; Pl. 43, fig. 5.

Shell small, very broadly conic, creamy-white. All of the whorls moderately rounded, excepting the last which is very strongly rounded. All marked by rather prominent lines of growth, and rather numerous irregularly disposed varices, of which there are sometimes several to a single whorl. Suture moderately constricted. Periphery of the last whorl inflated, strongly rounded. Base short, strongly rounded, marked like the spire. Aperture very large; posterior angle acute; outer lip thin at the edge, decidedly produced, and protracted in the middle to form a strong claw-like element; inner lip slender, slightly curved, somewhat revolute, free for its entire length; parietal wall glazed by a thin callus. Length, 2.7; diameter, 1.1 mm. (Bartsch.)

Type in United States National Museum, No. 215786. Type locality, San Diego, California.

Range. Known only from type locality.

Melanella ptilocrinicola Bartsch, 1907

Plate 43, fig. 2; Plate 44

Proceedings of the United States National Museum, **32**:555; Pl. 53; also **53**:335; Pl. 44, fig. 2, 1917.

Shell elongate-conic, thin, polished, transparent, tinged with bluish-white (the dried animal showing through the upper whorls as a granular golden-yellow mass.) Whorls 11, increasing regularly in size, decidedly rounded, with the surface weakly malleated, having a few feebly developed varices which appear at irregular intervals as narrow opaque vertical bands. Summit of the whorls closely appressed to the preceding turn, the extreme edge forming a slender spiral sutural band. Last whorl quite strongly inflated basally. Periphery and base well-rounded, marked like the spire. Aperture moderately large, suboval; outer lip thin, evenly curved; inner lip slender, vertical, slightly reflected; parietal wall covered by a thin callus. Operculum thin, corneous. Length, 9.5; diameter, 3.9 mm. (Bartsch.)

Type in United States National Museum, No. 195373. Type locality, United States Bureau of Fisheries Steamer "Albatross Station 3342, in 1,588 fathoms.

Range. Parasitic on *Ptilocrinus,* in 1,588 fathoms, off British Columbia.

Genus **ENTOCOLAX** Voight, 1888

Entocolax ludwigi Voight, 1888

Zeitschrift für Wissenschaftliche Zoologie, **47**:658; Pls. 41–43.

The description of this genus and species, the writer has not been able to get.

Genus **CYTHNA** Carpenter, 1864

Imbedded in starfish like *Stylifer,* from which it is distinguished by its normal nuclear whorls, and thin concentric operculum. (Tryon, *Structural and Systematic Conchology.*)

Type. *Stylifer tumens,* Carpenter.

Distribution. West coast of North America.

Cythna albida Carpenter, 1864

Proceedings of the California Academy of Sciences, 3:219.

C. t. minuta, albida, laevi, diaphana, lata; anfr. nucl. normalibus, vertice mamillato; norm. iii. tumidis, rotundatis, rapide augentibus suturis valde impressis; basi rotundata, valde umbilicata; umbilico subangulato; apertura subrotundata; peritremati continuo, acuto, t. adulta nonnunquam a partiete separato. (Carpenter.)

Shell minute, whitish, smooth, transparent, broad; with normal nuclear whorls, vertix mammillate; normally three tumid, rounded, increasing rapidly, with sutures strongly impressed; base rotund, strongly umbilicate; with subangular umbilicus; aperture subrotund. (Translation.)

Type in ? Type locality, San Pedro, California.

Range. Southern California, parasitic on starfish.

Genus **HALIELLA** Monterosato, 1873

Melanellids in which the inner lip is provided with a twist which gives it the appearance of having an obsolete fold. (Bartsch.)

Type. *Haliella stenostoma* A. Adams.

Distribution. West coast of America; Japan.

Haliella abyssicola Bartsch, 1908

Proceedings of the United States National Museum, 53:336; Pl. 48, fig. 8.

Shell elongate-conic, straight, semi-transparent, polished, bluish-white, marked by scarcely perceptible lines of growth. Whorls slightly rounded, rather high between the sutures; the appressed portion of the summit appearing as a narrow white band, the posterior limit of which forming the suture is scarcely perceptible since it practically fuses with the preceding turn. Periphery of the last whorl well-rounded. Base moderately long, well-rounded. Aperture very large, ear-shaped; posterior angle acute; outer lip very thin, becoming gradually protracted from the posterior angle to the periphery, then more rapidly retractive toward the base, basal portion of the outer lip forming a broad, rounded channel; inner lip long, decidedly sigmoid, slightly reflected and partly appressed to the base, provided with a twist a little anterior to its insertion; parietal wall covered with a thin callus. Length, 10.4; diameter, 2.9 mm. (Bartsch.)

Type in United States National Museum, No. 251266. Type locality, United States Bureau of Fisheries Steamer "Albatross" Station 2923, off southern California.

Range. In 822 fathoms off San Diego, California, to off Point Pablo, Lower California, in 284 fathoms.

Haliella lomana Dall, 1908

Plate 43, fig. 1

Proceedings of the United States National Museum, **34**:253; **53**:337; Pl. 44, fig. 1.

Shell slender, acute, flat-sided or nearly so; chalky white, with an extremely thin, yellowish, external coating; nucleus eroded; subsequent whorls very slightly convex, with an obscure peripheral angle on the last whorl, upon which the suture of the advancing whorl is closely appressed; surface smooth and polished except for very obscure and minute spiral lines only visible in good light with a lens; base convexly rounded, imperforate; aperture ovate-quadrate, the outer lip simple, thin, gently arcuate; the body bare, the pillar almost straight, twisted and with a very obscure prominence like an obsolete plait; an examination of the interior of the upper whorls, however, shows no plication; anterior of the aperture gently rounded; there are no indications of varices or resting stages on the spire. Height of shell, 20.0; of last whorl, 10.0; of aperture, 6.5; max. diam., 7.0 mm. (Dall.)

Type in United States National Museum, No. 110652. Type locality, United States Bureau of Fisheries, Station 4354, sixteen miles off Point Loma, San Diego, California.

Range. Known only from type locality.

Genus **STROMBIFORMIS** Da Costa, 1778

Very attenuated, slender *Melanellids,* with very narrow elongated aperture, having the inner lip appressed to the attenuated basal portion of the preceding whorls; marked with one or more spiral color bands. (Bartsch.)

Type. *Strombiformis glaber* Da Costa.

Distribution. West Indies, west coast of North America, Florida. Fossil: Pliocene.

Strombiformis almo Bartsch, 1917

Proceedings of the United States National Museum, **53**:342; Pl. 46, fig. 5.

Shell broadly elongate-conic, polished, bluish-white, excepting a broad band of light chestnut-brown, which encircles the turns covering a little more than half the spaces between the periphery and the summit and extending for an equal distance over the base. Early whorls rounded, separated by a well-impressed suture, the succeeding turns moderately rounded, with very poorly impressed suture, marked by faint lines of growth and an occasional almost vertical line, which is not accompanied by any brown marking. Periphery of the last whorl well-rounded. Base produced, well-rounded. Aperture broadly ovate, somewhat patulose anteriorly; posterior angle acute; outer lip thin; inner lip short, moderately stout, curved, reflected over, and appressed to the base, except at the extreme tip, where it is free; parietal wall covered with a thick callus. Length, 7; diameter, 1.8 mm. (Bartsch.)

Type in United States National Museum, No. 251395. Type locality, United States Bureau of Fisheries Steamer "Albatross" Station 2902, in 53 fathoms, off Santa Rosa Island, California.

Range. Santa Rosa Island to San Diego, California.

Strombiformis californicus Bartsch, 1917

Plate 48, fig. 5

Proceedings of the United States National Museum, **53**:340; Pl. 45, fig. 5.

Shell narrowly subulate, polished. Early whorls yellowish-white, succeeding ones light brown, marked with a dark chestnut-brown band at the periphery. A second one of equal strength and size is a little anterior to the middle between the summit and the periphery; lip edged with dark brown. Early whorls rounded, separated by impressed sutures, the succeeding turns flattened with scarcely defined suture, marked by exceedingly fine lines of growth and slightly retractive, irregularly disposed, pale brown, varicial streaks. Periphery of the last whorl well-rounded. Base produced, well-rounded. Aperture elongate, oval; posterior angle acute, slightly effuse anteriorly; outer lip thin, inner lip long, curved, revolute appressed to the base, excepting at the very tip, where it is free; parietal wall covered with a moderately thick callus. Length, 11.5; diameter, 2.1 mm. (Bartsch.)

Type in United States National Museum, No. 249619. Type locality, San Diego Bay, California.

Range. Catalina Island to San Diego, California.

Strombiformis alaskensis Bartsch, 1917

Plate 48, fig. 1

Proceedings of the United States National Museum, **53**:339; Pl. 45, fig. 1.

Shell small, straight, yellowish-white, marked by exceedingly fine lines of growth only. Whorls rather high, almost flattened, appressed at the summit, separated by a scarcely impressed suture. Periphery of the last whorl well-rounded, base moderately long, moderately rounded. Aperture oval; posterior angle acute; outer lip decidedly protracted between the posterior angle and the base; inner lip moderately stout, curved, reflected over and appressed to the base; parietal wall glazed with a moderately thick callus. Length, 4.2; diameter, 1.4 mm. (Bartsch.)

Type in United States National Museum, No. 322301. Type locality, Dutch Harbor, Unalaska, Alaska.

Range. Known only from type locality.

Genus **ACLIS** Lovèn, 1846[1]

Shell minute, like *Turritella;* usually spirally striated; apex sinistral; aperture oval; outer lip prominent; axis slightly rimate. Operculate. (Loven.)

Type. *Aclis nitidissima* Macgillivary—*Truncatella montagui* Lowe.

Distribution. West coast of America; Europe. Fossil: Devonian—Europe, United States.

Subgenus Graphis Jeffreys, 1869

Aclis shepardiana Dall, 1919

Proceedings of the United States National Museum, **56**:342.

Shell minute, slender, translucent yellowish, with about nine whorls, including the rather blunt smooth apical nucleus; suture constricted, distinct, coils of the spire rather lax; axial sculpture of minute close-set plications which start from the suture and become feeble on the base; these are crossed by minute close spiral striae most evident near the periphery, and under the lens showing an inconspicuous reticulation; base imperforate, rounded and somewhat produced; aperture ovate, the margin thin, not reflected, interrupted by the body, produced anteriorly. Height of shell, 3.7; diameter, 1 mm. (Dall.)

Type in United States National Museum, No. 107276. Type locality, San Pedro, California.

Range. San Pedro to San Diego, California.

Subgenus Aclis s.s.

Aclis turrita Carpenter, 1864

Supplementary Report, British Association for the Advancement of Science, 657. *Proceedings of the California Academy of Sciences,* **3**:219, 1866. *Proceedings of the United States National Museum,* **39**; Pl. 62, fig. 4.

St. t. minima, albida, solidiore, laevi, turrita; anfr. nucl. iii. subnaticoideis, apice mamillato; norm. v. plamatis, angustis, suturis parum impressis; basi subito rotundata, haud umbilicata; apertura subrotundata; labro postice parum contracto. Long., 0.06; long. spir., 0.04; lat., 0.02 poll. (Carpenter.)

Minute, slender base rounded. (Carpenter.)

Type in United States National Museum, No. 15566. Type locality, San Pedro, California.

Range. Known only from type locality.

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[1] For description of new species received while this volume was in press, see Appendix, p. 281.

Aclis occidentalis Hemphill, 1894

Zoë, **4**: 395. *Proceedings of the United States National Museum,* **39**; Pl. 62, fig. 2.

Shell small, turriculated, white, shining, transparent, consisting of about nine, rather flattish, convex whorls, with a single fine, revolving thread-like lirae above the periphery, and with very fine microscopic revolving striae beneath, observable only with a good glass and light; suture deep; aperture subquadrate; lip simple, acute; columella straight. Length, 4; breadth, 1 mm. (Hemphill.)

TYPE in Hemphill Collection (now at Stanford University). Type locality, San Diego, California.

RANGE. Known only from type locality.

Genus **NISO** Risso, 1826

Shell turriculated, smooth, polished, apex very sharp; umbilicus perforated or wide; aperture small, angulated above and below. (Tryon, *Structural and Systematic Conchology.*)

DISTRIBUTION. China, West America. Fossil: Eocene—Paris; and Cretaceous.

Niso lomana Bartsch, 1917

Proceedings of the United States National Museum, **53**:350; Pl. 49, fig. 4.

Shell large, broadly conic, yellowish-white. Early whorls well-rounded, later ones flattened, separated by a decidedly channeled suture, narrowly shouldered at the summit and decidedly angulated at the periphery, marked only by feeble axial lines of growth. The summit of succeeding turns falls a little anteriorly to the angulated periphery and forms a channeled suture. Aperture of the type fractured. The type has lost the early whorls and the base. The nine whorls remaining measure: length, 14.5 mm. (Bartsch.)

TYPE in United States National Museum, No. 211847. Type locality, United States Bureau of Fisheries Steamer "Albatross" Station 2901, in 48 fathoms, off Santa Rosa Island, California.

RANGE. Santa Rosa Island to Point Loma, California.

Niso hipolitensis Bartsch, 1917

Proceedings of the United States National Museum, **53**:350; Pl. 49, fig. 5.

Shell very small, elongate-conic, narrowly umblicated. Tip yellowish-white, base white with a broad median brown band; anterior half of aperture white. Surface polished, marked by fine line of growth only. Surface feebly impressed. Periphery of the last whorl angulated. Base short, well-rounded. Aperture broadly oval; posterior angle acute; outer lip thin, curved and slightly patulose; inner lip curved and revolute, almost covering the narrow umbilicus. Length, 3.1; diameter, 1.2 mm. (Bartsch.)

Type in United States National Museum, No. 127544. Type locality, San Hipolite Point, Lower California.

Range. San Diego, California, to San Hipolite Point, Lower California.

Family PYRAMIDELLIDAE

Genus **PYRAMIDELLA** Lamarck s.s.

Shell of many whorls, turreted, umbilicated; columella with three fold; outer lip usually re-enforced within, at regular intervals, by spiral lamellar thickenings. The sculpture consists of mere lines of growth and very fine spiral striations. (Bartsch.)

Type. *Trochus dolabratus* Linnaeus.

Distribution. World-wide, from low water to 90 fathoms. Fossil: Cretaceous.

Subgenus Longchaeus Mörch, 1875

Pyramidella adamsi Carpenter, 1864

Supplementary Report, British Association for the Advancement of Science, 546. *Bulletin 68,* United States National Museum, 21; Pl. 1, figs. 6, 6*a*, 1909.

Shell elongate-conic, early whorls white, later ones diversely variegated frequently dark brown on the later turns. It is this striking variegated color pattern which at once distinguishes this species from the other west American forms. The spaces between the sutures are crossed by light areas, which are vertical in the middle, bending suddenly forward at the periphery and the summit, thus forming]-shaped areas. The space immediately below the peripheral sulcus, but with retractive slant. The space between these light areas, near the summit, forms a series of elongated dark spots. The varices which are disposed at regular intervals are chestnut-brown, preceded usually by a band of white. Posterior half of the base light chestnut-brown; anterior white. Nuclear whorls small, two, forming a planorboid spire whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-half immersed.

Post-nuclear whorls flattened; moderately shouldered at the summit, which is crenulated. Periphery with a strong sulcus. Base moderately long, well-rounded. Entire surface of spire and base marked by fine lines of growth and exceedingly fine, microscopic spiral striations. Aperture oval; outer lip thin, showing the following color markings within; a white zone at the periphery, a narrow chestnut band immediately posterior to the periphery and another at the summit, a broad band extending over half the base immediately below the peripheral zone; deep within, the lip is re-enforced by five strong, spiral cords, one at the periphery, two on the base, and two between the periphery and the summit; columella strong, provided with a strong fasciole, posterior fold very strong, lamellar, anterior two very oblique, slender. Length, 11.3; diameter, 3.8 mm. (Bartsch.)

TYPE in United States National Museum. Type locality, Cape San Lucas, Lower California.

RANGE. Monterey, California, to Mazatlan, Mexico.

Figured specimen No. 11866, in United States National Museum comes from La Paz, Lower California.

Pyramidella mazatlanica Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 24; Pl. 1, figs. 7, *7a.*

Shell very regularly conic, horn color, with a darker band on the middle between the sutures, which is bordered at its anterior margin by a faint light line. Nuclear whorls two, forming a depressed helicoid spire whose axis is at right angles to that of the succeeding turns, in the first of which it is about two-thirds immersed. Post-nuclear whorls flattened, scarcely at all contracted at the suture, with a narrow, very finely crenulated shoulder at the summit. Sutures well-impressed. Periphery of the last whorl strongly, sharply, and deeply sulcate. Base short, well-rounded, with a strong fasciole at the insertion of the columella. Entire surface of the spire and base marked only by lines of growth. Aperture irregularly oval; posterior angle acute, with a moderate channel anteriorly; outer lip thin, re-enforced by four strong internal lirations, two of which are above and two below the periphery; columella slender, twisted and revolute, posterior fold lamellar, anterior two slender and very oblique. Length, 11; diameter, 3.5 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 162714. Type locality, United States Bureau of Fisheries Station 3019, in 14 fathoms, off Cape Tepoca, west coast of Mexico.

RANGE. San Diego, California, to Cape Tepoca, west Mexico.

Pyramidella mexicana Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 23; Pl. 1, fig. 12.

Shell large, robust, broadly conic, dull brown. (Nuclear whorls decollated.) All but the last post-nuclear whorl flattened, flatly shouldered and crenulated at the summit; the last inflated and well-rounded. Periphery of the last whorl marked by a strong sulcus. Sutures channeled. Entire surface of spire and base marked by lines of growth, which are quite prominent on the last turn. Base inflated, strongly rounded, with a slender fasciole at the insertion of the columella. Aperture oval; posterior angle acute; slightly channeled anteriorly; outer lip thin, with a white band at the periphery, the remainder brown with darker colored lines, re-enforced deeply within by five spiral cords, two of which are posterior and three anterior to the periphery; columella stout, conic, with a strong lamellar fold at its insertion and two much more oblique ones anterior to it. Length, 19; diameter, 6.5 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 105558. Type locality, Scammons Lagoon, Lower California.

RANGE. San Diego, California, to Scammons Lagoon, Lower California.

Genus **TURBONILLA** Risso, 1826[1]

Shell with sinistral apex, cylindro-conic, many-whorled, generally slender; with a single columella fold which varies in strength and frequently is not visible in the aperture. The sculpture both axial and spiral ranges from obsolete to strongly incised lines or raised lamellae. (Bartsch.)

TYPE. *Turbonilla typica* Dall and Bartsch.

DISTRIBUTION. World-wide; range from low water to 90 fathoms.

Turbonilla gilli Dall and Bartsch, 1907

Plate 49, fig. 8

Proceedings of the United States National Museum, 33: 493; Pl. 44, fig. 5.

Shell small, rather stout, inflated, dirty white. Nuclear whorls decollated, early post-nuclear whorls well-rounded, later ones flat, broader at the summit than at the suture; sculpture of about fourteen strong, almost vertical, scalariform axial ribs on the second, and sixteen quite protractive ones on the succeeding whorls; on the penultimate turn, however, they are less oblique than on those preceding it. These ribs are very strongly developed at the summit of the whorls and render the deeply channeled suture decidedly coronated. Intercostal spaces deep, of about double the width of the ribs, interrupted suddenly at the decidedly angulated (almost keeled) periphery of the last whorl, beyond which they reappear. Base strongly contracted, quite short, marked by the faint continuations of the axial ribs, which extend to the umbilical region. Outer lip fractured; aperture of columella very strong, somewhat curved and revolute, provided with a subobsolete oblique fold. Length, 3.3; diameter, 1.1 mm. (Dall and Bartsch.)

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[1] For descriptions of new species, received while this volume was in press, see Appendix, pp. 281–286.

Type in United States National Museum, No. 163009. Type locality, San Diego, California.

Range. Catalina Island to San Diego, California.

Turbonilla gilli delmontensis Dall and Bartsch, 1907

Plate 49, fig. 12

Proceedings of the United States National Museum, **33**: 494; Pl. 44, fig. 7.

Shell similar to *T. gilli,* but much more stout and less turreted, with the ribs less strongly developed and the peripheral thickening only weakly represented. Length, 3.4; diameter, 1.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 195921. Type locality, off Del Monte, Monterey, California, in 12 fathoms.

Range. Known only from type locality.

Turbonilla acra Dall and Bartsch, 1909

Plate 49, fig. 14

Bulletin 68, United States National Museum, 32; Pl. 2, fig. 14.

Shell very long and slender, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls high between the sutures, varying in outline, the first to eleventh being flattened, almost cylindric, with very strongly shouldered summits, the rest moderately well-rounded, with less strongly shouldered summits. Axial ribs very strong on the first eleven whorls, less so and more rounded on the remaining. There are about fourteen upon each of the first eleven turns, twenty-two upon the twelfth, twenty upon the thirteenth, fourteenth, and fifteenth, and about thirty much enfeebled and irregular ones upon the last turn, where they pass over the well-rounded periphery and base to the umbilical region. On the early turns the axial ribs terminate as strong, exserted cusps at the summit; on the last turn they are merely rounded. Early sutures strongly marked, later ones well-impressed. Aperture ovate, posterior angle acute; outer lip thin; columella slender, almost straight, obliquely inserted. Length, 10; diameter, 1.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206848. Type locality, off Catalina Island, California.

Range. Known only from type locality.

Turbonilla diegensis Dall and Bartsch, 1909

Plate 49, figs. 13, 13*a*

Bulletin 68, United States National Museum, 31; Pl. 2, fig. 13.

Shell small, subdiaphanous to dingy white. Nuclear whorls two and one-half, helicoid, loosely coiled, decidedly elevated, about one-fifth immersed, having their axis at right angle to that of the later whorls. Post-nuclear whorls, moderately rounded, somewhat overhanging, the greatest convexity being on the lower third of the exposed portion of the whorls, traversed by fourteen broad, coarse and strong, oblique, and somewhat flexuous axial ribs on the fourth and seventh whorl and eighteen on the eighth. These ribs extend over the angulated periphery to the umbilical region, appearing fainter on the base; the deep intercostal grooves terminate at the periphery, i.e., do not appear on the base as gouged out spaces, as they do posterior to the periphery, but simply as plain shallow grooves between the ribs formed by the raising of these above the general surface of the shell. The whorls slope rapidly toward the suture and are somewhat contracted and shouldered at the summit, thus marking a prominent subchanneled suture. Aperture large, broadly ovate, showing the axial ribs within; outer lip thin, subpatulous, shortly curved to meet the short, somewhat revolute, slightly twisted, columella. Length, 5.3; diameter, 1.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 130316. Type locality, San Diego, California.

Range. San Pedro to San Diego, California.

Subgenus CHEMNITZIA Orbigny, 1839

Turbonilla hypolispa Dall and Bartsch, 1909

Plate 49, figs. 5, 5*a*

Bulletin 68, United States National Museum, 34; Pl. 2, fig. 5.

Shell broadly conic, yellowish-white. Nuclear whorls very small, two and one-half, forming a rather elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is a little more than half immersed. Post-nuclear whorls well-rounded, slightly shouldered at summit, marked by very strong, sublamellar, protractive axial ribs, of which fourteen occur upon the second and third, sixteen upon the fourth to eighth, eighteen upon the ninth and tenth, twenty upon the eleventh, twenty-four upon the twelfth, and twenty-five upon the penultimate turn. On the early whorls these ribs are very strong in the middle, bending suddenly toward the summit, which gives them a decidedly angulated appearance a little below their termination; on the last three whorls they are more closely crowded and less strongly developed. Intercostal spaces about one and one-half times as wide as the ribs on the early whorls; on the last three they are about equal to them, well-impressed, terminating a little above the sutures. Sutures well-marked. Periphery of the last whorl slightly angulated. Base short, well-rounded. Aperture rhomboidal; columella slender, somewhat curved, and slightly reflected. Length, 8.1; diameter, 2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206851. Type locality, University of California Station 43, off San Diego, California.

RANGE. Catalina Island to San Diego, California.

Turbonilla aepynota Dall and Bartsch, 1909

Plate 49, figs. 10, 10*a*

Bulletin 68, United States National Museum, 35; Pl. 2, figs. 10, 10*a*.

Shell small, elongate-conic, diaphanous. Nuclear whorls two and one-half, small, helicoid, forming a moderately elevated spire, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls high between the sutures, very strongly shouldered at the summits, somewhat contracted at the periphery, well-rounded, marked by strong, sublamellar axial ribs that render the summits strongly crenulate. Sixteen of the axial ribs appear upon the first and second, eighteen upon the third, fourth, and fifth, and twenty upon the remaining turns. Intercostal spaces a little wider than the ribs, deeply sunk below the general surface, extending to the suture on all the turns of the spire. Sutures strongly marked. Periphery of the last whorl feebly angulated. Base short, well-rounded, smooth. Aperture rather large, subquadrate, posterior angle obtuse; outer lip thin, bent abruptly anteriorly toward the columella, which it joins almost at right angles; columella very slender and gently curved. Length, 3.2; diameter, 0.9 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 162443. Type locality, off San Martin Island, Lower California, in 30 fathoms.

RANGE. San Pedro, California, to San Martin Island, Lower California.

Turbonilla santarosana Dall and Bartsch, 1909

Plate 49, figs. 7, *7a;* Plate 56, fig. 7

Bulletin 68, United States National Museum, 36; Pl. 2, figs. 7, *7a.*

Shell small, delicate, subdiaphanous to milk-white. Nuclear whorls two and one-half, forming a moderately elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in front of which it is very slightly immersed. Post-nuclear whorls well-rounded, slopingly shouldered near the summit, slightly constricted at the suture, marked by broad, low, rounded, axial ribs which become somewhat flattened at the summit. Of these sixteen occur upon the first to fourth, eighteen upon the fifth and sixth, while upon the penultimate they are very much enfeebled and ill-defined. Intercostal spaces narrow, shallow, the depressed area terminating a little posterior to the suture. Sutures constricted. Periphery and base of the last whorl somewhat inflated. Aperture moderately large, rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella very thin and strongly curved. Length, 4.5; diameter, 1.4 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 163239. Type locality, United States Bureau of Fisheries Station 2902, in 53 fathoms, off Santa Rosa Island, California.

RANGE. Santa Rosa Island to San Diego, California.

Turbonilla engbergi Bartsch, 1920

Journal of the Washington Academy of Sciences, 10.

Shell small, elongate, conic, thin, semitransparent, bluish-white. Nuclear whorls decollated. Post-nuclear whorls moderately rounded, appressed at the summit, marked by broad, slightly protractively slanting axial ribs, which fourteen occur upon all of the remaining turns except the last, on which there are sixteen. These ribs are a little broader than the spaces that separate them, and they become slightly flattened and weaker toward the summit. The intercostal spaces are deeply depressed pits, which terminate somewhat posterior to the summit of the succeeding turn, leaving a broad, smooth band at the suture. Suture strongly constricted. Periphery of the last whorl well-rounded, not crossed by the strong axial ribs. Base short, well-rounded, marked by incremental lines only. Aperture subquadrate, posterior angle obtuse; outer lip thin; inner lip slightly sinuous, decidedly obliquely inserted, the inner edge having a decidedly protractive slant; parietal wall devoid of callus. Altitude, 3.7; diameter, 1.1 mm. (Bartsch.)

Type in United States National Museum, No. 334489. Type locality, San Juan Island, Washington.

Range. Known only from type locality.

Turbonilla gabbiana Cooper, 1870

American Journal of Conchology, **6**:66. *Bulletin 68,* United States National Museum, 35.

Shell small, very slender, long, white; vertex broken; whorls eleven or more, flattened on the sides; sutures strongly impressed, ribs about twenty-three, large, obtuse, running from the suture to the margin of the base; base convexly truncated, smooth; aperture subcircular; columella thick. Length, 10; diameter, 3.3 mm. (Gabb.)

This shell can be readily distinguished by its extremely slender form and the strong, slightly oblique ribs. (Gabb.)

Type in California Geological Survey. Type locality, Monterey, California.

Range. Known only from type locality.

Turbonilla muricatoides Dall and Bartsch, 1907

Plate 49, figs. 11, 11*a*

Proceedings of the United States National Museum, **33**:495; Pl. 14, fig. 2. *Bulletin 68,* United States National Museum, 38; Pl. 2, figs. 11, 11*a*.

Shell small, slender, subdiaphanous to milk-white; nuclear whorls two and one-half, helicoid but slightly elevated, well-rounded, having their axis at right angles to the axis of the post-nuclear turn. Post-nuclear whorls smooth, rather high between the sutures, moderately rounded, marked by strong sublamellar axial ribs, which are about half as wide as the spaces that separate them, and extend strongly to the very summit of the whorl where they render the well-marked sutures crenulate. There are fourteen of these ribs upon the first, eighteen upon the fifth, and twenty upon the penultimate turn. The depressed intercostal spaces terminate abruptly at the periphery. Base of the last whorl well-rounded, smooth, without sculpture. Aperture: (outer lip fractured), columella slender, slightly twisted. Length, 3; diameter, 1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 195942. Type locality, Monterey, California.

Range. Known only from type locality.

Turbonilla clarinda Bartsch, 1912

Proceedings of the United States National Museum, 42:264; Pl. 35, fig. 4.

Shell elongate-conic, bluish-white, semi-translucent. Nuclear whorls two and one-half, forming a rather solute, elevated, helicoid spire, whose axis is at right angles to the succeeding turns, in the first of which it is slightly immersed. Post-nuclear whorls well-rounded, appressed at the summit, marked by a very regular, rounded, slightly protractive, axial rib, of which sixteen occur upon the first to seventh, eighteen upon the eighth and the penultimate turn. These ribs become slightly flattened and somewhat expanded at the summit. Intercostal spaces a little wider than the ribs, well-impressed, terminating a little posterior to the suture, thus leaving a plain, narrow band immediately above the suture. Sutures somewhat constricted. Periphery and base of the last whorl well-rounded, smooth. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip slender, slightly sinuous, and very slightly revolute. Length, 4.7; diameter, 1.1 mm. (Bartsch.)

TYPE in United States National Museum, No. 211546. Type locality, San Diego Bay, California.

RANGE. Known only from type locality.

Turbonilla raymondi Dall and Bartsch, 1909

Plate 49, figs. 17, 17*a*

Bulletin 68, United States National Museum, 39; Pl. 2, figs. 17, 17*a*.

Shell acicular, milk-white. Nuclear whorls small, two and one-half, forming a low helicoid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which the nuclear spire is about one-fifth immersed. Post-nuclear whorls well-rounded, increasing very regularly in size, high between the sutures, almost appressed at the summit and ornamented by well-developed, rounded, axial ribs, of which there are sixteen upon the second and third, eighteen upon the fourth, twenty upon the fifth to eighth, twenty-two upon the ninth and penultimate whorls. Intercostal spaces deep, about one and one-half times as wide as the ribs. Periphery of the last whorl angulated. Base short, well-rounded. Aperture subquadrate. Columella short, slightly curved and somewhat oblique. Length, 6.2; diameter, 1.6 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206849. Type locality, off Catalina Island, California.

RANGE. Santa Rosa Island to San Diego, California.

Turbonilla kelseyi Dall and Bartsch, 1909

Plate 49, figs. 16, 16*a*

Bulletin 68, United States National Museum, 39; Pl. 2, fig. 16.

Shell small, semi-transparent. Nuclear whorls small, two and one-fourth, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls moderately rounded, ornamented by somewhat sinuous, slightly protractive, rounded axial ribs, which are lower and somewhat expanded at the slightly shouldered summits of the whorls; fourteen of these appear upon the third, sixteen upon the fourth, eighteen upon the fifth, 20 upon the sixth and seventh, twenty-two upon the eighth, and twenty-four upon the penultimate post-nuclear whorl of the type. Intercostal spaces only moderately impressed. Periphery of the last whorl well-rounded. Base moderately long, well-rounded. Aperture suboval, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella short, stout, twisted, provided with a weak fold at its insertion. Length, 4.7; diameter, 0.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 46506. Type locality, San Diego, California.

Range. Santa Barbara, California, to San Ignacio, Lower California.

Turbonilla muricata Carpenter, 1856

Plate 49, fig. 9

Catalogue of the Collection of Mazatlan Shells, 428. *Bulletin 68,* United States National Museum, 36; Pl. 2, fig. 9.

Shell elongate-conic, milk-white. Nuclear whorls three, forming an elevated helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is almost half immersed. Post-nuclear whorls moderately rounded, somewhat contracted at the suture, strongly shouldered at the summit, marked by very strong, slightly protractive axial ribs, of which 14 occur upon the first to fourth and 16 upon the remaining turns. These ribs extend prominently to the summit which they render muricated. Intercostal spaces as wide as the ribs, deeply impressed, terminating at the periphery. Sutures very strongly marked. Periphery and base of the last whorl well rounded, smooth. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, slightly twisted and curved. Length, 2.3; diameter, 0.7 mm. (Bartsch.)

Type in Liverpool Collection, British Museum. Type locality taken from *Spondylus* at Mazatlan, Mexico.

Range. Lower California, Gulf of California.
This was described as *Chemnitzia muricata.*

Subgenus Strioturbonilla Sacco, 1892

Turbonilla dinora Bartsch, 1912

Proceedings of the United States National Museum, **42**:265.

Shell very elongate-conic, milk-white. Nuclear whorls small, at least two, about one-third immersed in the first of the succeeding turns. Post-nuclear whorls slightly rounded, narrowly shouldered at the summit, marked by very strong, very regular, broad, rounded, slightly curved, decidedly protractive, axial ribs, of which fourteen occur upon the first to seventh whorl, sixteen upon the eighth and ninth, eighteen upon the tenth and the penultimate turn. Intercostal spaces very strongly impressed, as wide as the ribs, terminating a little anterior to the suture. Periphery of the last whorl well-rounded; base short, well-rounded, marked by lines of growth and numerous, exceedingly fine spiral striations; the latter also cross the ribs and intercostal spaces on the spire. Sutures strongly constricted. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip short, somewhat curved and revolute, without apparent fold; parietal wall glazed with a thin callus. Length, 9.2; diameter, 2.2 mm. (Bartsch.)

Type in United States National Museum, No. 211553. Type locality, San Diego Bay, California.

Range. Known only from type locality.

Turbonilla buttoni Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 43; Pl. 3, figs. 4, 4*a*.

Shell irregularly elongate-conic, yellowish-white. Nuclear whorls two, very small, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are very slightly immersed. Post-nuclear whorls slightly rounded, ornamented by very regular, rounded, somewhat sinuous, and decidedly protractive axial ribs, which extend undiminished from the summit to the periphery of the whorls and very feebly beyond this on the base. There are sixteen of these ribs upon the first to third, eighteen upon the fourth and fifth, twenty upon the sixth to ninth, and twenty-two upon the penultimate turn. Intercostal spaces well-impressed, about as wide as the ribs. Sutures well-marked, rendered wavy by the strong ribs. Periphery of the last whorl well-rounded. Base short, well-rounded. Entire surface of the spire and base marked by numerous exceedingly fine wavy spiral striations. Aperture subquadrate, posterior angle obtuse; outer lip thin; columella short, moderately strong, slightly twisted and reflected, provided with a weak oblique fold at its insertion. Length, 6.3; diameter, 1.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 163241. Type locality, San Pedro, California.

Range. Santa Rosa Island, California, to Point Abreojos, Lower California.

Turbonilla canadensis Bartsch, 1917

Plate 51, fig. 11

Proceedings of the United States National Museum, **52**:641; Pl. 44, fig. 11.

Shell elongate-conic, slender, yellowish-white. Nuclear whorls small, two and one-half, depressed helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls almost flattened, rather high between the sutures, appressed at the summit, marked by quite regular, slightly curved, protractive, axial ribs, of which fourteen occur upon the first, sixteen upon the second and third, eighteen upon the fourth and the seventh, twenty upon the eighth, and twenty-two upon the ninth and the penultimate turn. Intercostal spaces not quite as wide as the ribs, deeply impressed, terminating at the periphery, which is decidedly angulated. There is a smooth space between the periphery and the succeeding whorl, which falls at some little distance anterior to the periphery of the preceding turn. This gives the whorls a somewhat overhanging appearance. Sutures well-constricted. Base short, well-rounded, entire surface marked by miscroscopic striations. Aperture subquadrate, posterior angle obtuse; outer lip thin; inner lip slightly curved and somewhat revolute. Length, 6.3; diameter, 1.5 mm. (Bartsch.)

Type in United States National Museum, No. 273964. Type locality, Forrester Island, Alaska.

Range. Known only from type locality.

Turbonilla vancouverensis Baird, 1863

Proceedings, Zoölogical Society of London, 67. *Bulletin 68,* United States National Museum, 44; Pl. 4, fig. 9.

Ch. testa elongata-turrita, cylindrica, longitudinaliter oblique forte costata; anfractibus novem, ultimo superne indistincte costato, infra laevigato; apertura parva, rotundato-ovata; suturis impressis. Length, ¼ in.

This shell is peculiarly ribbed. The eight upper whorls are strongly and somewhat obliquely ribbed; but on the last, which is the largest, the ribs are indistinct on the upper half, and on the lower half disappear altogether. The interstices between the ribs, which in the penultimate whorl are about sixteen in number, appear smooth. The sutures are deep and well-marked. The mouth is rather small, and is somewhat rounded-ovate. (Baird.)

Type in British Museum. Type locality, Esquimalt Harbor, Vancouver Island. "Taken from the crop of a Pin-tail Duck."

Range. Port Etches, Alaska, to Puget Sound.

Turbonilla attrita Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 46; Pl. 4, figs. 11, 11*a*.

Shell slender, elongate-conic, bluish-white. Nuclear whorls small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are slightly immersed. Post-nuclear whorls very high between the sutures, almost flattened, ornamented with very low, flattened, somewhat irregular, protractive axial ribs, which are best developed on the early whorls. Of these there are eighteen upon the second, twenty-two upon the third, eighteen upon the fourth and fifth, twenty-two upon the sixth, eighteen upon the seventh, twenty upon the eighth and ninth; on the next turn they become quite enfeebled, and on the penultimate turn they are obsolete. Intercostal spaces about half as wide as the ribs and very shallow. Sutures well-impressed. Periphery of the last whorl well-rounded. Base short, somewhat inflated. Entire surface of the spire and base marked by numerous very fine, wavy spiral striations. Aperture broadly oval; posterior angle acute; outer lip thin; columella short, slender, somewhat curved, and slightly reflected. Length, 7.4; diameter, 1.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162248. Type locality, San Pedro, California.

Range. San Pedro to San Diego, California.

Turbonilla asser Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 45; Pl. 3, figs. 1, 1*a*.

Shell elongate-conic, milk-white. Nuclear whorls small, two, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Post-nuclear whorls well-rounded, slightly overhanging, ornamented by well-developed, somewhat sinuous, rounded, protractive axial ribs, of which there are about fourteen upon the third, sixteen upon the fourth and fifth, eighteen upon the eighth, twenty upon the ninth to eleventh, and twenty-two upon the twelfth and penultimate turns. Intercostal spaces almost equal to the ribs in width, shallow, terminating some little distance posterior to the summit of the succeeding whorl, thus leaving a rather broad, plain band above the suture in each turn. Sutures strongly constricted. Periphery of the last whorl well-rounded. Base short, well-rounded. Entire surface of spire and base marked by very fine, closely spaced, spiral striations. Aperture subquadrate. Posterior angle obtuse, outer lip thin, showing the external markings within, columellar slender, well-curved and slightly revolute. Length, 8.3; diameter, 1.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 163244. Type locality, off Redondo, California.

Range. Redondo to San Diego, California.

Turbonilla bakeri Bartsch, 1912

Proceedings of the United States National Museum, **42**:265; Pl. 35, figs. 10, 10*a*.

Shell elongate-conic, bluish-white. Nuclear whorls small, two and one-half, forming a quite elevated, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls slightly rounded, narrowly shouldered at the summit, somewhat constricted at the suture, marked by very regular, strong, rounded, slightly protractive, axial ribs, which become somewhat expanded at the summit. Of these ribs, fourteen occur upon the first four turns, sixteen upon the fifth to tenth, eighteen upon the eleventh, and twenty upon the penultimate turn. Intercostal spaces strongly impressed, almost as wide as the ribs, terminating shortly before reaching the suture, thus leaving a narrow plain band immediately above the suture. Sutures well-impressed. Periphery of the last whorl and short base well-rounded, smooth, except for fine incremental lines and the numerous, exceedingly fine, closely-spaced, wavy, spiral striations which cover the entire surface of the shell. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip almost straight, slightly revolute; parietal wall glazed with a thin callus. Length, 8; diameter, 1.8 mm. (Bartsch.)

Type in United States National Museum, No. 211549. Type locality, San Diego Bay, California.

Range. Known only from type locality.

Turbonilla encella Bartsch, 1912

Proceedings of the United States National Museum, **42**:265; Pl. 35, figs. 1, 1*a.*

Shell small, elongate-conic, bluish-white. Nuclear whorls decollated. Post-nuclear whorls well-rounded, slightly shouldered at the summit, crossed by broad low, decidedly protractive, axial ribs, which become slightly flattened at the summit. Of these ribs, fourteen occur upon the second of the remaining turns, sixteen upon the third to seventh, and twenty upon the penultimate turn. Intercostal spaces a little wider than the ribs, the impressed portion terminating at a little distance posterior to the suture, leaving a narrow, plain band just above this. Suture well-marked. Periphery of the last whorl and the moderately long base well-rounded, the latter marked by the feeble continuations of the axial ribs, which extend to the umbilical area. Entire surface of spire and base marked by numerous, strong, rather coarse, wavy, spiral striations, which on the spire extend equally strong over the ribs and intercostal spaces. Aperture subquadrate; posterior angle obtuse; outer lip (fractured) thin; inner lip moderately strong, somewhat curved, and reflected. Length, 4.5; diameter, 1.2 mm. (Bartsch.)

Type in United States National Museum, No. 211547. Type locality, San Pedro, California.

Range. Known only from type locality.

Turbonilla torquata Gould, 1852

Boston Journal of Natural History, **6**:384; Pl. 14, fig. 10.

T. solida, turrita, lactea; anfrac. 8 convexiusculis, plicis longitudinalibus, flexuosis, perobliquis ad 16 ornatis; anfractu ultimo subangulato, basi inornata; apertura subovata, labro incrassato. (Gould.)

Shell minute, turreted, solid milk-white, composed of eight moderately convex whorls, separated by a deep suture, each one with about sixteen very oblique, somewhat flexuose folds, quite well-marked, not quite reaching the suture; the spaces between do not exhibit revolving lines. The last whorl is slightly angular at periphery, at which point the folds terminate, and the base is quite destitute of sculpture. Aperture subovate, lip thick; columella somewhat revolute, joining the lip below at nearly a right angle. Length, 1/5; breadth, 1/20 in. (Gould.)

Type in ? Type locality, Santa Barbara, California.

Range. Point Fermin to San Diego, California.

Described as *Chimnitzia torquata.*

Turbonilla stylina Carpenter, 1865

Annals and Magazine of Natural History, series 3, **15**:396. *Bulletin 68,* United States National Museum; Pl. 3, figs. 7, 7*a*.

C. testa "C. torquatae" simili sed valde teretiore, gracillima, interdum subdiaphana; anfr. nucl. ii., decliviter sitis, margines spirae fere parallelos vix superantibus; norm. xii, angustis, subplanatis, suturis distinctis; costis radiantibus circ. xxiii, latis declivibus, testa juniore continuis, adulta fascis haud sculpta suprasuturali separatis; interstitiis parvis, haud sculptis; basi rotundata, haud sculpta; columella parum torta. Long., .32; long. spir., 27; lat., 8 poll. (Carpenter.)

Shell slender, subdiaphanous to milk-white. Nuclear whorls two, smooth, depressed, helicoid, scarcely extending beyond the outline of the spire and having their axis at right angles to the axis of the succeeding turns. Post-nuclear whorls well-rounded, separated by strongly constricted sutures, rather high, ornamented by rather low, broad, rounded, sinuous, protractive axial ribs, of which there are sixteen upon the first, twenty upon the fifth, and twenty-eight upon the penultimate turn. Intercostal spaces moderately depressed, about as wide as the ribs, terminating a short distance above the sutures, thus leaving a narrow, smooth band between the termination of the ribs and the suture as in *T. torquata* Gould, but not quite as wide as in that species. Periphery of the last whorl well-rounded. Base rather short, well-rounded. Entire surface marked by very fine wavy spiral striations. Aperture subovate, outer lip thin; columella slender, moderately long, slightly twisted, almost vertical. (Bartsch.)

TYPE in British Museum. Type locality, Santa Barbara, California.

RANGE. Monterey, California, to the Coronado Islands.

Described as *Chemnitzia stylina.*

Turbonilla carpenteri Dall and Bartsch, 1909

Bulletin 68, United States National Museum; Pl. 3, figs. 9, 9*a*.

Shell long, slender, bluish-white. Nuclear whorls small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls exceedingly high between the sutures, evenly rounded, marked by almost vertical axial ribs, which become slightly expanded and flattened at the summits. There are eighteen of these ribs upon the first to third, twenty upon the fourth to sixth, twenty-two upon the seventh, twenty-four upon the eighth and ninth, and twenty-six upon the tenth. Upon the penultimate turn they become decidedly irregular and enfeebled.

Intercostal spaces about one-half as wide as the ribs, but little depressed below the general surface of the shell. Sutures somewhat constricted. Periphery of the last whorl well-rounded. Base short and somewhat inflated, marked by feeble extensions of the axial ribs. Entire surface of spirals and base crossed by numerous fine wavy, spiral striations. Aperture subquadrate, rather elongated, posterior angle obtuse, outer lip thin; columella rather long, slender, slightly sinuous. Length, 7.9; diameter, 1.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 160065. Type locality, San Pedro, California.

Range. Known only from type locality.

Turbonilla simpsoni Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 49; Pl. 3, figs. 6, 6*a*.

Shell elongate-conic, rather slender, bluish-white. Nuclear whorls two and three-fourths, depressed, heliocoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls well-rounded, marked by very strong, well-raised, almost vertical, axial ribs, of which sixteen occur upon all the whorls of the type. These ribs are strongest in the middle and slightly lower on the summit and periphery. Intercostal spaces deeply impressed, equaling the ribs in width, terminating a very little posterior to the suture. Sutures somewhat constricted. Periphery of the last whorl well-rounded. Base rather short, well-rounded. Entire surface of the spire and base marked by fine wavy, spiral striations. Aperture subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella short, slender, and oblique. Length, 6.7; diameter, 1.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 152750. Type locality, San Pedro, California.

Range. Off Redondo to San Diego, California.

Turbonilla profundicola Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 50; Pl. 3, figs. 11, 11*a*.

Shell elongate-conic, milk-white, shining. Nuclear whorls very small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are but slightly immersed. Post-nuclear turns well-rounded, very slightly shouldered at the summit, marked by gently protractively curved, low, rounded, well-developed axial ribs, of which sixteen occur upon the first three whorls, eighteen upon the fourth and fifth, twenty upon the sixth and seventh, twenty-two upon the eighth and the penultimate turn. Intercostal spaces about one and one-half times as wide as the ribs, well-impressed, terminating about one-tenth of the width of the space between the sutures, posterior to the basal suture as a plain band. Sutures strongly constricted. Periphery of the last whorl well-rounded. Base short, well-rounded. Entire surface of the spire and base marked by numerous microscopic, closely crowded, wavy, spiral striations. Aperture subquadrate, very broad at base, posterior angle obtuse; outer lip thin, bent very strongly at its basal angle; columella slender, slightly oblique, almost straight, weakly revolute. Length, 6.3; diameter, 1.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206856. Type locality, United States Bureau of Fisheries Station 4322, off La Jolla, California.

Range. Off Catalina Island to San Diego, California, in 197 fathoms.

Turbonilla serrae Dall and Bartsch, 1907

Proceedings of the United States National Museum, 33:497; Pl. 44, figs. 8, 8*a*.

Shell slender, very elongate-conic, subdiaphanous to milk-white. Nuclear whorls decollated. Post-nuclear whorls very high between the sutures, moderately rounded, slightly contracted at the periphery and somewhat shouldered at the summit, rendering the sutures subchanneled. The whorls are marked by subequal and subequally spaced, rather broad, rounded, almost vertical axial ribs, which are a little wider than the intercostal spaces; the depressed portion of the latter terminating a little above the suture. In the type which has lost the nucleus and probably the first two post-nuclear turns, there are sixteen ribs on the third of the remaining whorls, twenty upon the eighth, twenty-two upon the eleventh, and twenty-four upon the next, the penultimate turn. On this whorl the axial ribs are less regular and less strongly developed, showing senile degeneration. Periphery of the last whorl well-rounded. Base short, well-rounded, marked by slender continuations of the axial ribs, which extend feebly to the insertion of the columella. Entire surface of spire and base crossed by numerous, closely placed, spiral striations. Aperture subquadrate, posterior angle obtuse, outer lip thin, columella rather strong, somewhat oblique, and slightly revolute, without apparent fold in the aperture. Length, 7.7; diameter, 1.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 196198. Type locality, off Del Monte, Monterey, in 12 fathoms.

Range. Known only from type locality.

Turbonilla humerosa Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 52; Pl. 3, figs. 10, 10*a*.

Shell elongate-conic, milk-white. Nuclear whorls very small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls very strongly rounded moderately shouldered at the summit, marked by many strong lamellar, protractive axial ribs, which slope suddenly from a point about one-third of the distance between the sutures, anterior to the summit, giving the whorls a shouldered appearance at this place. Of these ribs, fourteen occur upon the second to fourth, sixteen upon the fifth to ninth, eighteen upon the tenth, and twenty upon the penultimate turn. Intercostal spaces deeply impressed, double the width of the ribs. Sutures strongly marked. Periphery of the last whorl well-rounded. Base short, well-rounded. Entire surface of spire and base marked by many fine, wavy, spiral striations. Aperture subquadrate, posterior angle obtuse. Outer lip rather thick and somewhat revolute. Length, 6; diameter, 17 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206857. Type locality, off Catalina Island, California.

RANGE. Catalina Island to San Diego, California.

Turbonilla galianoi Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 51; Pl. 4, figs. 12, 12*a*.

Shell elongate-conic, milk-white shining. Nuclear whorls very small, two and one-half, forming a rather elevated spire, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls well-rounded, very strongly tabulately shouldered at the summit, ornamented with well-developed, rounded, slightly protractively curved axial ribs. Of these ribs sixteen occur upon the first, second, and third, eighteen upon the fourth and fifth, twenty upon the sixth, twenty-two upon the seventh, twenty-four upon the eighth, twenty-six upon the ninth, and twenty-eight upon the penultimate turn. These ribs extend equally strong from the summit to the periphery of the whorls. Intercostal spaces not quite as wide as the ribs, well-impressed, extending anteriorly to the suture. Sutures strongly constricted. Periphery of the last whorl well-rounded. Base rather long, well-rounded. Entire surface of the spire and base marked by exceedingly fine spiral striations. Aperture subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella almost straight, slightly revolute. Length, 6.1; diameter, 1.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 4104. Type locality, Cape San Lucas, Lower California.

Range. San Diego, California, to Cape San Lucas, Lower California.

Turbonilla kincaidi Bartsch, 1921

Proceedings of the Biological Society of Washington, **34**: 33.

Shell rather broadly elongate-conic, yellowish white. Nuclear whorls decollated. The remaining turns are moderately well rounded and somewhat overhanging, appressed at the summit, decidedly constricted at the suture, marked by rather depressed, slightly retractively slanting axial ribs, of which eighteen occur upon the first of the remaining turns, and twenty upon all the other turns. The spaces which separate the ribs are moderately impressed and terminate roundly about one-eighth of the distance between the summit and the suture. Periphery of the last whorl well-rounded. Base short, inflated, well-rounded, marked by the feeble continuation of the axial ribs, which become evanescent before reaching the umbilicus. In addition to the foregoing sculpture the entire surface of the spire and base is marked by very fine, closely spaced, spiral striations. Aperture rather large, very broadly oval, almost subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip slender, somewhat sinuous, reflected over and appressed to the base for three-fourths of its length; parietal wall covered by a moderately thick callus. Length, 5.5; diameter, 1.7 mm. (Bartsch.)

Type in United States National Museum, No. 340844. Type locality, Dogfish Bay, Puget Sound.

Range. Puget Sound, Washington.

Turbonilla dracona Bartsch, 1912

Proceedings of the United States National Museum, **42**:266; Pl. 35, figs. 2, 2*a*.

Shell very elongate-conic, bluish-white. Nuclear whorls small, two, helicoid, having their axis at right angles to that of the succeeding turns. Post-nuclear whorls well-rounded, somewhat shouldered at the summit, marked by strong, somewhat curved, decidedly protractive, axial ribs, which extend undiminished from the summit to the periphery, between the sutures, while on the last whorl they continue feebly over the base. Of these ribs, fourteen occur upon the first, sixteen upon the second, eighteen upon the third to eighth, twenty upon the ninth and tenth, and twenty-two upon the penultimate turn. Intercostal spaces about one and one-half times as wide as the axial ribs, deep. Sutures deeply impressed, rendered sinuous by the summits of the ribs. Periphery and the short base of the last whorl well-rounded, marked by the feeble continuations of the axial ribs and numerous, exceedingly fine, closely spaced, spiral striations; the latter may also be seen on the spire. Aperture moderately large, subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within, inner lip moderately long, almost straight, provided with a very feeble fold at its insertion. Length, 6.9; diameter, 1.5 mm. (Bartsch.)

Type in United States National Museum, No. 211548. Type locality, San Diego, California.

Range. Known only from type locality.

Turbonilla aresta Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 54; Pl. 4, figs. 5, 5*a*.

Shell very slender, milk-white. Nuclear whorls small, two and one-half, forming a moderately elevated, helicoid spire, which has its axis at right angles to that of the succeeding whorls, and is not at all immersed. Post-nuclear whorls moderately rounded, marked by sublamellar, protractive axial ribs, which extend undiminished to the summit of the whorls, rendering this crenulated. There are fourteen of these upon the first three whorls, sixteen upon the fourth to eighth, eighteen upon the ninth, twenty upon the tenth and eleventh, and twenty-one upon the penultimate turn. Intercostal spaces about one and one-half times as wide on all but the last three whorls; on the latter they are about as wide as the ribs and terminate a little posterior to the suture. Sutures strongly marked. Periphery of the last whorl faintly angulated. Base short, well-rounded. Aperture moderately large, subquadrate, posterior angle obtuse. Outer lip thin, bent almost at right angles to the anterior lateral angle. Columella slender, slightly curved and slightly revolute. Length, 6.4; diameter, 1.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206858. Type locality, University of California Station, Catalina Island.

Range. Santa Rosa Island to San Diego, California.

Turbonilla barkleyensis Bartsch, 1917

Plate 51, fig. 9

Proceedings United States National Museum, 52:641; Pl. 42, fig. 8; Pl. 44, fig. 9.

Shell large, slender, elongate-conic, bluish-white. Nuclear whorls small, a little more than two and a quarter, depressed, helicoid, having their axis at right angles to that of the succeeding turn, in the first of which they are slightly immersed. Post-nuclear whorls well-rounded, appressed at the summit, marked by slender, curved, moderately regular, slightly protractive, axial ribs, of which sixteen occur upon the first to fifth, eighteen upon the sixth, twenty-two upon the seventh and eighth, twenty-four upon the ninth and tenth, and twenty-six upon the penultimate turn. Intercostal spaces moderately impressed, terminating a little posterior to the periphery of the whorls. The summit of the succeeding turns falls a little anterior to the termination of the intercostal pits and leaves a smooth band in the suture. Suture moderately constricted. Periphery of the last whorl obtusely angulated. Base moderately long, weakly rounded. The entire surface of the shell is marked by microscopic striations. Aperture large, broad, subquadrate, somewhat effuse at the junction of the basal and the outer lip, posterior angle obtuse; outer lip very thin showing the external sculpture within; inner lip decidedly oblique, slightly curved and somewhat revolute; parietal wall covered by a thin callus. Length, 9.2; diameter, 2 mm. (Bartsch.)

TYPE in Geological Survey of Canada Collection. Type locality, Barkley Sound, Vancouver Island, British Columbia.

RANGE. Known only from type locality.

Turbonilla doredona Bartsch, 1917

Plate 51, fig. 3

Proceedings of the United States National Museum, **52**: 642; Pl. 44, fig. 3.

Shell very regularly, broadly elongate, conic, yellowish white. Nuclear whorls, two and three-fourths, strongly rounded, smooth, forming a strongly elevated spire having its axis at right angles to that of the succeeding turns, in the first of which the side of the last volution is about one-fifth immersed. Postnuclear whorl well rounded, slightly curved at the appressed summit, marked by rather distantly spaced, slender, narrow, well-rounded axial ribs which become somewhat flattened and enfeebled toward the summit. Of these ribs, 18 occur upon the first, 16 upon the second to fourth, and 18 upon the remaining turns. Intercostal spaces about two and one-half times as wide as the ribs, terminating at little posterior to the suture, thus leaving a very narrow plain band between their termination and the summit of the succeeding turn. Suture moderately constricted. Periphery of the last whorl well rounded. Base short, strongly rounded, marked by the feeble continuations of the axial ribs which become evanescent before reaching the middle of the base. Entire surface of the shell crossed by rather marked, subequally strong and subequally spaced, deeply incised spiral striations. Aperture subquadrate; posterior angle obtuse (outer lip partly fractured) ; inner lip thick, almost straight, and somewhat revolute, provided with an obsolete oblique fold a little anterior to its insertion; parietal wall glazed by a fine callus. Length, 4.2; diameter, 1.3 mm. (Bartsch.)

TYPE in United States National Museum, No. 268719. Type locality, United States Steamer "Albatross" at Station 5678, off Redondo Point, Magdalena Bay, Lower California.

RANGE. Known only from type locality.

Subgenus PYRGOLAMPROS Sacco, 1892

Turbonilla ridgwayi Dall and Bartsch, 1909

Plate 52, figs. 10, 10*a*

Bulletin 68, United States National Museum, 62; Pl. 6, figs. 10, 10*a*.

Shell robust, brown. Nuclear whorls two and one-half, moderately large, forming a depressed helicoid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls flattened in the middle, rounded at the moderately strong shoulder at the summit, and at the periphery; marked by strong, well-elevated, rounded, almost vertical axial ribs, which are slightly contracted in the middle and somewhat sinuous. Of these ribs, eighteen occur upon the third to sixth and twenty upon the penultimate whorl. Intercostal spaces well-impressed, decidedly so in the middle, a little wider than the ribs. Sutures strongly marked, rendered sinuous by the ribs at the summits of the whorls. Periphery of the last whorl well-rounded. Base moderately long, well-rounded, marked by the feeble continuations of the axial ribs. Entire surface of the base and spire marked by closely crowded, wavy, well-incised spiral striations. Aperture moderately large, oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, somewhat curved and revolute, provided with a weak oblique fold at its insertion. Length, 4.6; diameter, 2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 162560. Type locality, San Diego, California.

RANGE. Known only from type locality.

Turbonilla victoriana Dall and Bartsch, 1907

Plate 50, fig. 3

Proceedings of the United States National Museum, 33:501; Pl. 44, fig. 6.

Shell elongate-conic, wax yellow to light brown. Nuclear whorls and the early succeeding turns eroded in all the specimens examined. Post-nuclear whorls quite high between the sutures, somewhat concave in the posterior two-thirds of the exposed portion, only slightly contracted toward the periphery and faintly shouldered at the summit; ornamented by low, rounded, somewhat sinuous axial ribs, which are about as wide as the shallow intercostal spaces. Sutures well-marked. Periphery and base of the last whorl somewhat inflated, marked by weak continuations of the axial ribs, which extend feebly to the umbilical region. Entire surface crossed by numerous, wavy spiral striations. Aperture rather elongate, oval, outer lip thin; columella moderately long, decidedly twisted and somewhat revolute in its free anterior portion; the twist at its insertion appearing as a fold. Length, 7; diameter, 2.1 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 126660a. Type locality, Victoria, Vancouver Island, British Columbia.

RANGE. Known only from type locality.

Turbonilla valdezi Dall and Bartsch, 1907

Plate 52, fig. 8

Proceedings of the United States National Museum, 33:502; Pl. 44, figs. 3, *3a.*

Shell inflated, robust, broad and stumpy, of light, fulvous coloration. Nuclear whorls decollated in the type. Post-nuclear whorls flattened, somewhat contracted at the periphery and rounded at the summit, traversed by broad, coarse, irregularly slanting, axial ribs, which extend over the inflated periphery of the last whorl to the umbilical region, appearing less prominent on the base. About 16 of these ribs occur upon the second, 18 upon the fifth, and 24 upon the penultimate post-nuclear whorl. Entire surface of the shell crossed by very minute, close spiral striation. Suture subchanneled and wavy. Aperture ovate, outer lip thin, joining the twisted and revolute columella in a broad curve. Length, 5.6; diameter, 2.1 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 32273. Type locality, Monterey, California.

RANGE. Barkley Sound, Vancouver Island, to Monterey, California.

Turbonilla newcombei Dall and Bartsch, 1907

Plate 52, fig. 3; Plate 54, fig. 6

Proceedings of the United States National Museum, 33:45; fig. 6.

Shell regularly, broadly conic, white on the posterior half and light brown on the anterior half of the exposed portion of the whorl; base white. Nuclear whorls decollated in all the specimens seen. Post-nuclear whorls somewhat overhanging, decidedly contracted toward the periphery from the anterior fifth of the exposed part; almost flattened posterior to this, and closely appressed at the summit, separated by strongly marked sutures. Ribs about 18 upon all the turns, almost vertical, moderately elevated, rounded in the middle, decidedly flattened and widened at the summit, disappearing at the periphery. Intercostal spaces not depressed below the general surface, a little wider than the ribs. Periphery and the moderately long base well-rounded, smooth, excepting the fine spiral striation which covers the entire surface of the shell. Aperture subquadrate, posterior angle acute; outer lip thin, showing the color bands within; columella slender, oblique and slightly revolute. Length, 5.4; diameter, 2.1 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 126660. Type locality, Port Simpson, British Columbia.

RANGE. Port Simpson to Victoria, British Columbia.

Turbonilla taylori Dall and Bartsch, 1907

Plate 52, figs. *7, 7a*

Proceedings of the United States National Museum, 33:499; Pl. 44, fig. 9.

Shell very regularly elongate-conic, purplish-brown. Entire surface marked by numerous, closely placed, minute, spiral striations. Nuclear whorls small, depressed, helicoid, smooth, scarcely at all immersed, having their axis at a right angle to that of the later turns, the sides not projecting beyond the outline of the spire. Post-nuclear whorls quite high between the sutures, only slightly contracted toward the periphery and very weakly beveled at the appressed summits, marked by low, broad, retractive axial ribs, which are much more numerous and less strongly defined on the early whorls than on those succeeding. There are about 36 on the second, 30 upon the third, 24 upon the fourth, and 26 upon the antepenultimate post-nuclear turn. On the last whorl they become irregular and irregularly spaced, showing senility. The ribs become flattened and less strongly defined toward the summit and the periphery, disappearing at the well-rounded periphery. Sutures well-marked. Base short, inflated, rounded. Aperture suboval, somewhat effuse anteriorly; posterior angle acute; outer lip thin, white edges, chestnut-brown within except at the very base, which is white; columella slender, twisted, and slightly revolute anteriorly. Length, 6.5; diameter, 1.9 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196210. Type locality, Departure Bay, British Columbia.

RANGE. Port Simpson to Vancouver Island, British Columbia.

Turbonilla talma Dall and Bartsch, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N,* 13; Pl. 2, fig. 3.

Shell broadly elongate-conic, dark chestnut-brown, wax-yellow at the apex and the columellar area. Nuclear whorls decollated. Post-nuclear whorls moderately rounded, feebly shouldered at the summit, marked by strong, well-rounded axial ribs, of which eighteen occur upon each of the turns. Intercostal spaces about two-thirds as wide as the ribs, well-impressed. Sutures strongly impressed. Periphery of the last whorl well-rounded. Base moderately long, and well-rounded, showing scarcely any traces of the axial ribs. Entire surface of spire and base crossed by numerous, fine, closely spaced, spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing a lighter band half-way between the periphery and the summit, in the general chestnut coloration; columella slender, twisted and slightly revolute, white. Length, 9; diameter, 2.8 mm. (Dall and Bartsch.)

Type in Geological Survey Museum, Ottawa. Type locality, Barkley Sound, Vancouver Island, British Columbia.

Range. Known only from type locality.

Turbonilla halibrecta Dall and Bartsch, 1909

Plate 50, figs. 10, 10*a*

Bulletin 68, United States National Museum, 65; Pl. 5, figs. 10, 10*a*.

Shell elongate-conic. Nuclear whorls two, depressed, helicoid, having their axis at nearly right angles to that of the succeeding turns, in the first of which they are slightly immersed. Post-nuclear whorls flattened in the middle, slightly rounded toward the somewhat shouldered summit and the periphery, marked by strong, rounded, almost vertical axial ribs, of which there are 20 on the first to fifth, 18 upon the sixth, and 16 upon the remaining turns. Intercostal spaces a little wider than the ribs, well-impressed, sutures strongly marked. Periphery of the last whorl well-rounded, marked by the feeble continuations of the axial ribs. Base short, well-rounded. Entire surface of spire and base marked by exceedingly fine, closely crowded, spiral striations. Aperture rather small, oval; posterior angle acute; columella short and curved. Length, 6.2; diameter, 1.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 205950. Type locality, off Catalina Island, California.

Range. Known only from type locality.

Turbonilla gouldi Dall and Bartsch, 1909

Plate 52, figs. 1, 1*a*

Bulletin 68, United States National Museum, 66; Pl. 6, figs. 1, 1*a*.

Shell slender, light brown. Nuclear whorls small, two, depressed, helicoid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are slightly immersed. Post-nuclear whorls increasing regularly in size, marked by low, rounded, feebly developed axial ribs, of which there are 24 upon the second and fourth, 20 upon the fifth to eighth, 22 upon the ninth and penultimate turn. Intercostal spaces narrow and shallow. Sutures moderately impressed. Periphery of the last whorl well-rounded, somewhat inflated. Base short, inflated. Entire surface of spire and base covered by numerous fine, closely spaced, wavy spiral striations. Aperture oval; posterior angle acute; outer lip thick within, thin at edge; columella moderately long, sinuous, and slightly reflected. The above description is based on two cotypes, one No. 163256a, from San Pedro, California, has furnished the description of the nuclear and early whorls; the other, No. 159990, also from San Pedro, consisting of the last seven whorls, has furnished the adult characters. Length of first specimen, 5.8; diameter, 2 mm.; of second adult, specimen, length, 6.1; diameter, 2 mm. (Dall and Bartsch.)

Cotypes in United States National Museum, Nos. 163256a, and 159990. Type locality, San Pedro, California.

Range. Santa Rosa Island to San Diego, California.

Turbonilla halia Dall and Bartsch, 1909

Plate 50, fig. 11

Bulletin 68, United States National Museum, 68; Pl. 5, fig. 11.

Shell elongate-conic, wax-yellow at the summit, grading to brown at the suture; anterior part of the base, wax-yellow. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, rounding gently toward the summit and the suture, marked by low, broad, well-rounded, slightly protractive, axial ribs, of which 16 occur upon the second, 18 upon the third and fourth, 20 upon the fifth to seventh, 24 upon the eighth, and 28 upon the penultimate turn; upon this they are less regular, somewhat enfeebled and retractive. Intercostal spaces a little narrower than the ribs. Sutures well-impressed. Periphery of the last whorl well-rounded. Base moderately long, well-rounded. Entire surface of spire and base marked by numerous fine, crowded, wavy, spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture and coloration within; columella slender, slightly curved and revolute; parietal wall covered by a thin callus. Length, 8.5; diameter, 2.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 29328. Type locality, San Diego, California.

Range. Santa Barbara to San Diego, California.

Turbonilla berryi Dall and Bartsch, 1907

Plate 52, figs. 5, 5*a*

Proceedings of the United States National Museum, 33:500; Pl. 44, figs. 10, 10*a*.

Shell slender, very regularly acutely conic, bright chestnut-brown, with two narrow spiral bands of a lighter shade; one, the narrower of the two, is at the periphery; the other has its posterior edge at about the middle of the exposed portion between the sutures. Nuclear turns 2¼, smooth, depressed, helicoid, not immersed, having their axis at a right angle to the axis of the later whorls, their sides projecting slightly beyond the outlines of the spire. Post-nuclear whorls very high between the sutures, slightly beveled at the summit and moderately constricted at the periphery, ornamented by well-developed, acute, retractive axial ribs, of which there are about 20 upon the second, 24 upon the fifth, and 26 upon the penultimate turn. These ribs extend quite strongly to the summit, where they feebly crenulate the well-impressed sutures. Periphery and base of the last whorl well-rounded, marked by the continuations of the axial ribs, which gradually disappear as they cross the base. Entire surface marked by numerous very fine, closely spaced, wavy, spiral striation. Aperture suboval, somewhat effuse anteriorly; posterior angle acute; columella oblique, very slightly twisted and weakly revolute at its outer extremity. Length, 8; diameter, 2.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 196223. Type locality, Monterey Bay, California.

Range. Monterey Bay to Catalina Island, California.

Turbonilla lowei Dall and Bartsch, 1903

Plate 52, figs. 11, 11*a*

Memoirs of the California Academy of Sciences, 3: 278; Pl. 1, figs. 5, 5*a*.

Shell elongate-conic, uniformly light brown. Nuclear whorls two, small, depressed, helicoid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Early post-nuclear whorls increasing but little in diameter, rather high between the sutures, ornamented by very slender, somewhat sinuous, almost vertical axial ribs. Later whorls increasing more rapidly in diameter, less elevated between axial ribs, which become decidedly enfeebled as they approach the summit. There are almost 40 axial ribs upon the first, 34 upon the second, 30 upon the third, 25 upon the fourth, 20 upon the fifth to eleventh, and 22 upon the penultimate whorl. Intercostal spaces mere lines, on the first whorl, on the later ones shallow impressed areas of about half the width of the ribs. Sutures well-marked. Periphery of the last whorl inflated. Base short, well-rounded, posterior portion marked by the very feeble extensions of the axial ribs; the anterior smooth, excepting the very fine and exceedingly closely spaced spiral striations, which cover the entire surface of the shell. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, slightly twisted. Length, 7.2; diameter, 2.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 152751a. Type locality, off San Pedro, California.

RANGE. San Pedro to San Diego, California.

Turbonilla pugetensis Bartsch, 1917

Plate 51, fig. 4

Proceedings of the United States National Museum, 52:647; Pl. 44, fig. 4.

Shell small, elongate-conic, wax-yellow with a broad band of pale brown which extends posterior from the periphery, gradually fading into the general lighter color. Nuclear whorls and early post-nuclear turns decollated in all our specimens; those remaining feebly shouldered at the summit, flattened in the middle, becoming considerably contracted and rounded toward the suture, marked by broad, well-rounded, slightly protractive, axial ribs which become somewhat enfeebled and expanded toward the summit. Of these ribs 16 occur upon all of the turns remaining excepting the last, which has 18. Intercostal spaces shallow, about as wide as the ribs. Suture moderately contracted. Periphery of the last whorl well-rounded. Base somewhat inflated, well-rounded, marked by the feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base and numerous very fine spiral striations, which are also present on the spire. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip decidedly oblique, slender and somewhat revolute; parietal wall glazed with a very thin callus. Length, 4; diameter, 1.5 mm. (Bartsch.)

TYPE in United States National Museum, No. 268754. Type locality, Northwest Point, Elliot Bay, Seattle, Washington.

RANGE. Puget Sound, Washington.

Turbonilla tremperi Bartsch, 1917

Plate 51, fig. 7

Proceedings of the United States National Museum, 52:647; Pl. 44, fig. 7.

Shell short, elongate-conic, pale-brown. Nuclear whorls a little more than two, decidedly depressed helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls flattened in the middle, sloping toward the suture and the almost appressed summit, marked by strong lamellar, decidedly retractively slanting, axial ribs, of which 12 occur upon the first, 14 upon the second to fourth, 16 upon the fifth, 18 upon the sixth, and 16 upon the penultimate turn. These ribs extend prominently to the summit. Intercostal spaces strongly impressed, about 2½ times as wide as the ribs. Suture moderately constricted. Periphery of the last whorl feebly angulated. Base short, well-rounded, marked by the very feeble continuations of the axial ribs, which become evanescent before reaching the umbilical chink. Entire surface of the shell marked with fine, closely spaced striations. Aperture oval, posterior angle obtuse; outer lip thick; inner lip thick, almost straight, and slightly revolute; parietal wall covered by a thin callus. Length, 4.7; diameter, 1.2 mm. (Bartsch.)

Type in United States National Museum, No. 250629. Type locality, outside San Diego Bay, California.

Range. Known only from type locality.

Turbonilla alaskana Dall and Bartsch, 1909

Plate 52, fig. 9

Bulletin 68, United States National Museum, 70; Pl. 6, fig. 9.

Shell elongate-conic, wax-yellow, with a broad, peripheral, light-brown band, and a narrow one immediately below the summit; these are best seen in the aperture. (Nuclear whorls decollated in all our specimens.) Post-nuclear whorls increasing very slowly in diameter in the first three turns, then more rapidly. The summits of succeeding turns fall a little below the periphery, which gives the whorls an overhanging appearance. The whorls are marked by very strong, well-elevated, broad, rounded, irregularly slanting, axial ribs, which become slightly widened and flattened both at the summit and at the periphery. There are about 18 of them upon all but the last turn; upon this there are about 22. Intercostal spaces about as wide as the axial ribs. Sutures strongly impressed. Periphery of the last whorl somewhat angulated, base moderately long, well-rounded, marked by feeble extensions of the axial ribs and many fine, closely spaced, wavy spiral striations; the latter also mark the spaces between the sutures. Aperture moderately large, ovate, posterior angle acute; outer lip moderately thick; columella oblique, curved and strongly revolute; parietal wall covered by a strong callus. Length, 8; diameter, 2.6 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 160206. Type locality, St. Paul, Kodiak, Alaska.

RANGE. Kodiak to Sitka, Alaska.

Turbonilla chocolata Carpenter, 1866

Plate 50, figs. 9, 9*a*

Proceedings of the California Academy of Sciences, 3:220. *Bulletin 68,* United States National Museum, 70; Pl. 5, figs. 9, 9*a*.

Ch. t. *C. tridentatae* magnitudine et indole simili; sed teretiore, dense castanea, fasciis pallidioribus sub epidermide adhaerente ornata; anfr. primis gracillimis; vert. nucl. anfr. iii. helicoideis, valde decliviter sito, marginibus spirae rectis, angustis, haud superante; anfr. norm. xii. planatis, primis tumidioribus, suturis impressis; costis circ. xxviii. rotundatis, validis, circa basim prolongatam haud subito evanidis, anfr. ult. saepe obsoletis; interstitiis haud aequantibus, haud undatis, haud sulcatis; tota superficie sub lente minutissime et creberrime spiraliter striulata; apertura ovali, columella parum contorta, labro intus tenui, haud dentato. Long., 0.55; long. spir., 0.43; lat., 0.13 poll. (Carpenter.)

Shell slender, elongate-conic, uniformly golden-brown, shining. Nuclear whorls very small, planorboid, two and one-half, having their axis at right angles to that of the succeeding turns; not immersed. Post-nuclear whorls rather high between the sutures, slightly shouldered at the summit, flattened on the posterior three-fourths between the sutures; rounding on the anterior fourth to the somewhat contracted suture. Axial ribs slightly retractive, well-rounded, 22 upon the first eight whorls, 24 upon the ninth, and 28 upon the tenth; on the penultimate whorl they are poorly developed, split, and otherwise indicating a senile stage. Sutures well-impressed. Periphery and base of the last whorl inflated and well-rounded. The entire surface of the base and spire marked by numerous fine, wavy, closely spaced, spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; also three bands of color upon a bluish-white surface, one immediately below the summit, another covering the part corresponding to posterior half of the base, and a narrow one dividing the space between these two areas in equal halves; columella curved, moderately strong, and revolute. (Bartsch.)

TYPE in California State Collection, No. 428. Type locality, San Pedro, California.

RANGE. Known only from type locality.

Described as *Chemnitzia chocolata.*

Turbonilla painei Dall and Bartsch, 1909

Plate 50, figs. 4, 4*a*

Bulletin 68, United States National Museum, 71; Pl. 5, figs. 4, 4*a*.

Shell very slender, horn-yellow with a chestnut band about two-fifths the width of the space between the sutures immediately below the summits, and another about one-third as wide dividing the light area of the spire into equal parts. Posterior half of base chestnut-brown, anterior horn-yellow. Nuclear whorls small, two and one-fourth, depressed helicoid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are slightly immersed. Post-nuclear whorls slightly shouldered at the summit, weakly rounded, marked by strong, well-rounded retractive axial ribs, of which 24 occur upon the first, 22 upon the second, 20 upon the third to fifth, 22 upon the sixth to penultimate turn. Sutures well-impressed, rendered somewhat wavy by the strong terminations of the ribs at the summit of the whorls. Periphery of the base inflated, well-rounded. Base moderately long, well-rounded, marked by feeble continuations of the axial ribs. Entire surface of the base and spire bearing fine, closely crowded, wavy spiral striations. Aperture large; posterior angle acute; outer lip thin, showing the external sculpture and color markings within; columella slender, straight, oblique, and slightly revolute. Length, 7.3; diameter, 2.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 205952. Type locality, near Redondo Beach, California.

RANGE. Redondo Beach to San Diego, California.

Turbonilla keepi Dall and Bartsch, 1909

Plate 50, fig. 1

Bulletin 68, United States National Museum, 71; Pl. 5, fig. 1.

Shell elongate-conic, yellowish-white with a brown band about two-fifths the width of the space between the sutures, immediately below the summits, and one about one-third as wide, a little anterior to the middle of the remaining light area. Posterior half of base a little lighter brown than the bands between the sutures, grading into white on the anterior half. (Nuclear whorls decollated.) Post-nuclear whorls slightly shouldered, flattened, somewhat contracted at the periphery, marked by strong, well-rounded, almost vertical axial ribs, of which there are 22 upon the fourth to sixth, 24 upon the seventh to ninth, 26 upon the tenth, and 30 upon the penultimate turn. Intercostal spaces a little narrower than the ribs, well-impressed. Sutures strongly impressed, rendered sinuous by the strong terminations of the axial ribs at the summits of the whorls. Periphery of the last whorl well-rounded. Base moderately long, well-rounded. Entire surface of spire and base marked by numerous, very closely crowded, wavy, spiral striations. Aperture large; posterior angle acute; outer lip thin, showing the external sculpture and color bands within; columella very oblique, almost straight, and slightly revolute. Length, 11.7; diameter, 3.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 173080. Type locality, Long Beach, California.

Range. Long Beach to San Diego, California.

Turbonilla halistrepta Dall and Bartsch, 1909

Plate 50, fig. 2

Bulletin 68, United States National Museum, 72; Pl. 5, fig. 2.

Shell elongate-conic, wax-yellow, with a broad subsutural narrow submedian and a broad subperipheral band of golden brown. (Nuclear whorls decollated.) Post-nuclear whorls rather high between the sutures, very slightly shouldered, marked by almost obsolete, nearly vertical axial ribs, which are best developed near the summit and practically disappear before they reach the suture on the early whorls; on the last three they are scarcely indicated. Of these ribs there are about 28 upon the third and 24 upon the seventh whorl. Sutures well-impressed. Periphery and the short base of the last whorl somewhat inflated, well-rounded. Entire surface of spire and base marked by many well-incised, closely spaced, wavy, spiral striations. Some of the fine lirations between the incised lines are a little darker colored than the rest of the surface and appear as reddish-brown hair lines. Aperture oval; posterior angle acute; outer lip thin, showing the external markings within; columella slender, strongly curved and moderately revolute. Length, 9.5; diameter, 2.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 205954. Type locality, off Newport, California.

Range. Known only from type locality.

Turbonilla lituyana Dall and Bartsch, 1909

Plate 50, fig. 8

Bulletin 68, United States National Museum, 72, Pl. 5, fig. 8.

Shell elongate-conic, light wax-yellow, with a supra and subperipheral light-chestnut band, separated by a very narrow, dark wax-yellow peripheral zone. (Nuclear whorls decollated.) Post-nuclear whorls rather high between the sutures, early ones with moderately strong, broad, low, almost vertical, axial ribs, which become quite obsolete on the last turn and a half. About 22 of these ribs appear upon the eighth whorl. Intercostal spaces narrow and weakly impressed. Sutures well-rounded. Periphery and base of the last whorl well-rounded, the latter marked by continuations of the obsolete riblets and the fine, close, wavy spiral striations, which also cover the entire surface of the spire. Aperture oval; posterior angle acute; outer lip thin; columella slender, oblique, slightly curved and revolute, with a slight fold at its insertion; parietal wall covered by a thin callus. Length, 11.5; diameter, 3.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 160208. Type locality, Lituya Bay, Alaska.

Range. Known only from type locality.

Turbonilla oregonensis Dall and Bartsch, 1907

Plate 50, fig. 5; Plate 54, fig. 2

Proceedings of the United States National Museum, 33:503; Pl. 45, fig. 2.

Shell elongate-conic, wax-yellow, with two yellowish-brown spiral bands, the posterior one of which encircles the turns a little above the periphery, while the anterior one, which is a little wider, is immediately posterior to it, the two being separated by a space about as wide as the posterior band. Nuclear whorls decollated in all our specimens. Post-nuclear turns very slightly rounded, moderately contracted at the periphery and closely appressed to the preceding turn at the summit. There are no well-defined ribs, the axial sculpture being reduced to mere lines of growth with here and there a weakly impressed area, probably representing an obsolete intercostal space. Sutures strongly impressed. Periphery of the last whorl faintly angulated. Base short, well-rounded. Entire surface marked by fine, regular, close, spiral striation. Aperture pyriform, posterior angle acute; outer lip thin, columella somewhat twisted, scarcely revolute at its free end. The type has eight and one-half whorls remaining, which measure: Length, 8.5; diameter, 2.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 181112. Type locality, United States Fish Commission Steamer "Albatross" Station 2885, off Oregon coast, in 30 fathoms.

Range. Off the coast of Washington and Oregon.

Turbonilla gloriosa Bartsch, 1912

Proceedings of the United States National Museum, 42:268; Pl. 35, fig. 9.

Shell very slender, elongate-conic, wax-yellow, with a broad, brown band, which on the early and the later whorls extends over the anterior half, between the sutures, while on the middle ones it covers fully two-thirds of that space. Nuclear whorls decollated. Post-nuclear whorls flattened in the middle, rounding moderately toward the summit and the periphery, marked by strong, regular, retractive, axial ribs, of which fourteen occur upon the second of the remaining turns, sixteen upon the third, eighteen upon the fourth to sixth, twenty upon the seventh and eighth, while upon the remaining volutions they become much enfeebled and less regular. These ribs upon the middle whorls are strongest in the middle, sloping gently toward the summit and periphery, the slope at the summit lending them a shouldered effect. Intercostal spaces deeply impressed, about as wide as the ribs. Sutures strongly impressed. Periphery of the last whorl somewhat inflated, well-rounded. Base moderately long, well-rounded, marked by the feeble continuations of the axial ribs. Entire surface of spire and base crossed by numerous very fine, spiral striations. Aperture subquadrate; posterior angle obtuse; outer lip, showing the banding of the exterior within; inner lip very oblique, slightly curved, and revolute, with an obscure fold at its insertion; parietal wall glazed with a very thin callus. Length, 8.3; diameter, 2 mm. (Bartsch.)

TYPE in United States National Museum, No. 211511. Type locality, outside San Diego, California.

RANGE. Known only from type locality.

Turbonilla pesa Dall and Bartsch, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N,* 14; Pl. 2, fig. 5.

Shell elongate-conic, small, chestnut-brown, with a slightly paler, broad, obscure band half way between the sutures. Nuclear whorls decollated. Post-nuclear whorls flattened, slightly shouldered at the summit, marked by feeble, almost vertical, axial ribs; of which twenty-two occur upon the second, twenty-four upon the third, twenty upon the fourth and fifth, and twenty-six upon the sixth of the remaining turns. Upon the penultimate turn the ribs are subobsolete. Intercostal spaces feebly impressed, of irregular width. Sutures well-impressed. Periphery of the last turn somewhat inflated, well-rounded; base short, well-rounded. Entire surface of spire and base crossed by numerous very fine, closely spaced, spiral striations.

Aperture broadly oval; posterior angle acute; outer lip thin, showing the external markings within by transmitted light; columella moderately strong, slightly curved, and revolute. Length, 6; diameter, 1.6 mm. (Dall and Bartsch.)

TYPE in ? Type locality, Barkley Sound, Vancouver Island, British Columbia.

RANGE. Known only from type locality.

Turbonilla rinella Dall and Bartsch, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N,* 14; Pl. 1, fig. 2.

Shell elongate-conic, reddish wax-yellow, a little lighter on the posterior half between the sutures; anterior half of base almost white. Nuclear whorls decollated. Posterior two-thirds of the post-nuclear whorls between the sutures flattened; anterior third rounding moderately toward the periphery; whorls marked by feebly developed, low, broad, retractive, axial ribs, which are separated by narrow, shallow, intercostal spaces. Of these ribs, twenty-two occur upon the fourth, twenty-four upon the fifth and sixth, twenty-six upon the seventh, and about forty-two upon the last of the remaining turns. Upon the last they are very irregular and even less strongly developed than on the preceding. Sutures well-impressed. Periphery of the last whorl somewhat inflated, well-rounded, with scarcely any traces of axial sculpture. Entire surface of spire and base marked with numerous wavy, closely spaced, spiral striations. Aperture broadly oval; posterior angle acute; outer lip thin; columella oblique, slender, and revolute; parietal wall covered with a fairly thick callus. Length, 8.5; diameter, 2.3 mm. (Dall and Bartsch.)

TYPE in Geological Survey, Ottawa. Type locality, Barkley Sound, Vancouver Island, British Columbia.

RANGE. Known only from type locality.

Turbonilla lyalli Dall and Bartsch, 1907

Plate 52, figs. 6, 6*a*

Proceedings of the United States National Museum, 33:500; Pl. 44, fig. 4.

Shell small and slender with strong sculpture, whitish with a broad chestnut band which extends almost halfway over the exposed portion of the whorls above the periphery and an equal distance anteriorly over the base below the periphery. Nuclear whorls two, closely appressed to each other, forming a polished depressed helicoid spire, which does not extend beyond the outline of the post-nuclear spire, is not at all immersed and has its axis at right angles to the axis of the succeeding turns. Post-nuclear whorls decidedly flattened, moderately contracted at the periphery, and slightly shouldered at the summit, ornamented by strongly elevated, moderately broad, rounded retractive axial ribs, which become somewhat flattened toward the summit and periphery of the turns. There are about 22 ribs upon the second, 20 upon the fifth and the penultimate turn. Upon the first they are very weakly expressed. Intercostal spaces broad, almost double the width of the ribs. Sutures strongly impressed. Periphery and base of the last whorl well-rounded, marked by the continuations of the axial ribs which extend feebly to the umbilical region. Entire surface marked by numerous closely placed spiral striations. Aperture pyriform, posterior angle acute, columella almost straight, obliquely inserted, slightly revolute. Length, 5.7; diameter, 1.4 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196221. Type locality, Banks Island, British Columbia.

RANGE. Known only from type locality.

Turbonilla franciscana Bartsch, 1917

Proceedings of the United States National Museum, 52:645; Pl. 42, fig. 2.

Shell elongate-conic, flesh-colored, excepting a broad chestnut band which covers the median third of the last whorl. This dark band really consists of two chestnut-colored zones, the anterior of which embraces half of the band, while the posterior is equal to one-fourth of the width of the dark area, the two being separated by a zone of a little lighter shade which is as wide as the posterior zone. Nuclear whorls decollated in all the specimens seen. Post-nuclear whorl rather high between the sutures, feebly shouldered at the summit, and slightly constricted at the periphery. Early post-nuclear whorls marked by low, rounded, broad, almost vertical axial ribs which are wider than the shallow impressed spaces that separate them. On the later whorls the axial ribs become quite obsolete. On the first of the post-nuclear whorls there are eighteen of these ribs; on the second to fourth, twenty; on the fifth, they become decidedly feeble; and on the remainder they are not at all differentiated. In addition to the axial sculpture the surface of the shell is marked by very fine, wavy, closely spaced, spiral striations. Periphery of last whorl well-rounded. Base moderately long, well-rounded, marked by lines of growth and spiral striations comparable to those on the spire. Aperture broadly oval; outer lip thin, showing the color markings within. Columella curved, somewhat twisted, and slightly revolute; parietal wall glazed with a thin callus. Length, 6.8; diameter, 2 mm. (Bartsch.)

TYPE in United States National Museum, No. 214435. Type locality, U.S. Steamer "Albatross" Station 5743, in 10–15½ fathoms, San Francisco Bay, California.

RANGE. Known only from type locality.

Turbonilla pedroana Dall and Bartsch, 1903

Plate 52, figs. 12, 12*a*

Memoirs of the California Academy of Sciences, 3: 279; Pl. 2, figs. 3, 3*a*. (Arnold.)

Shell elongate-conic, posterior two-thirds between the sutures light brown, anterior third and base darker, the two areas being separated by a still darker band. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, rounded toward the summit; of which sixteen appear upon the first and second, eighteen upon the third to fifth, twenty upon the sixth, twenty-two upon the seventh and the penultimate turn. Intercostal spaces almost as wide as the ribs, shallow. Sutures well-impressed. Periphery and the rather short base of the last whorl somewhat inflated and well-rounded. Entire surface of spire and base marked by well-incised, closely spaced, fine, spiral striations; aperture rather small, oval; posterior angle acute; outer lip thin, showing the external sculpture and coloration within; columella sigmoid, slender, and slightly revolute. Length, 7; diameter, 2.3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 15275. Type locality, off San Pedro, California.

RANGE. Victoria, British Columbia, to San Diego, California.

Turbonilla macouni Dall and Bartsch, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N,* 15; Pl. 1, fig. 9.

Shell large, very broadly elongate-conic, pale wax-yellow, with three chestnut bands. The first of these bands extends over the posterior fourth of the whorls between the sutures, and is less strongly colored than the other two, which are very pronounced, about half as wide as the first, and occupy the space immediately anterior and posterior to the periphery; the space which separates them being a little narrower than the band. Nuclear whorls small, almost two; depressed, helicoid, having their axis almost at right angles to that of the succeeding turns; scarcely at all immersed. Post-nuclear whorls flattened on the posterior two-thirds between the sutures, slightly rounded anteriorly; moderately shouldered at the summit; marked by strong, well-rounded, somewhat sinuous, almost vertical, axial ribs which are as wide as the spaces which separate them. Of these ribs, eighteen occur upon the second, twenty upon the third and fourth, eighteen upon the fifth to seventh, twenty upon the eighth and ninth, twenty-two upon the tenth and penultimate turn. Periphery of the last well-rounded. Base of the last whorl moderately long, well-rounded, marked by the feeble continuations of the axial ribs. Entire surface of spire and base marked by numerous, closely spaced, very fine, spiral striations. Aperture moderately large, broadly oval; posterior angle obtuse; outer lip thin, showing the external markings within; parietal wall glazed with a thin callus. Length, 9; diameter, 3 mm. (Dall and Bartsch.)

TYPE in Geological Survey Museum, Ottawa. Type locality, Barkley Sound, Vancouver Island, British Columbia.

RANGE. Known only from type locality.

Turbonilla aurantia Carpenter, 1865

Plate 52, fig. 4; Plate 54, fig. 5

Journal de Conchyliologie, 12 (series 3, 5) : 147.

Ch. t. *Ch. chocolatae* simili, sed multo minore, latiore, haud tereti, aurantia; anfr. nucleosis. . . . . (detritis); normalibus 7 planatis, suturis impressis; costulis radiantibus circiter 26, haud expressis, ad peripheriam evanidis interstitiis late undatis; lineolis spiralibus castaneis creberrimis tota superficie ornata; basi subrotundata; columella parum torta; apertura ovata; labro tenui, acuto; labio haud conspicuo. Long., .23; long. spir., .16; lat., .07 poll. (Carpenter.)

Shell similar to *T.* (*P.*) *chocolata* Carpenter, but much broader, with the close spiral striation a little more pronounced than in that species, covered by a golden-yellow epidermis. Nuclear whorls decollated in all our specimens. Post-nuclear whorls moderately rounded, but little contracted at base and but very slightly shouldered at the summit, ornamented by about twenty-two moderately developed, slightly retractive axial ribs on each of the whorls. These ribs become quite obsolete as they pass over the well-rounded periphery and base of the last whorl. Intercostal spaces weak, much narrower than the ribs. Sutures quite prominent, simple. Aperture large, broadly ovate, posterior angle obtuse, somewhat effuse at base; outer lip thin, columella slender, quite oblique, twisted and revolute. (Dall and Bartsch.)

Type in United States National Museum, No. 4493b. Type locality, Puget Sound?

Range. Departure Bay, Victoria, British Columbia, to Puget Sound.

Subgenus Pyrgiscus Philippi, 1841

Turbonilla vexativa Dall and Bartsch, 1909

Plate 55, fig. 11

Bulletin 68, United States National Museum, 77; Pl. 7, fig. 11.

Shell stout, chestnut-brown. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, slightly rounded toward the appressed summit, and weakly contracted at the periphery, marked by weak, rounded, axial ribs, which terminate abruptly at the periphery, of which twenty-two occur upon the fifth, twenty-four upon the sixth and seventh, and twenty-six upon the penultimate turn. Intercostal spaces about one and one-half times as wide as the ribs, marked by six, equal and equally spaced, spiral grooves, which divide the space between the sutures into seven equal parts. Sutures well-impressed. Periphery of the last whorl angulated. Base short, marked by eight strongly incised spiral lines, which decrease in spacing from the periphery to the umbilical area. The space immediately behind the columella bears a number of closely spaced, fine, spiral striations. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external markings within; columella slender, somewhat twisted, and slightly revolute. Length, 6.2; diameter, 2.1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 160200. Type locality, San Pedro, California.

Range. San Pedro to San Diego, California.

Turbonilla obesa Dall and Bartsch, 1909

Plate 55, figs. 3, *3a*

Bulletin 68, United States National Museum, 78; Pl. 7, figs. 3, *3a.*

Shell robust, chocolate-brown. Nuclear whorls small, deeply obliquely immersed in the first post-nuclear turn, above which only the tilted edge of the last one projects. Post-nuclear whorls flattened, moderately shouldered at the summit, marked by strong vertical axial ribs, which are decidedly contracted at their junctions with the spiral grooves, which lends them a somewhat nodulous aspect. Of these ribs, sixteen appear on the first, eighteen upon the second, twenty upon the third to fifth, twenty-two upon the sixth, and twenty-four upon the penultimate turn. Intercostal spaces about as broad as the ribs, crossed by five strongly incised spiral grooves which almost cross the ribs. One of these is at the periphery. The remaining four appear in a double series; the one placed about as far below the summit as the other is above the periphery, the space between them being wider than that between the summit and the first pit below it. Two fine incised spiral lines mark the space between the summit and the first series of pits below it. Periphery of the last whorl marked by a broad plain band, well-rounded. Base very short, well-rounded, marked by about six unequal and unequally spaced strong incised lines. Aperture pear-shaped; posterior angle acute; outer lip thin, showing the external sculpture within; columella oblique, slightly revolute, provided with a moderately strong fold at its insertion. Length, 5.2; diameter, 1.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162563. Type locality, Pacific Beach, California.

Range. Known only from type locality.

Turbonilla nuttingi Dall and Bartsch, 1909
Plate 55, figs. 13, 13*a*

Bulletin 68, United States National Museum, 79; Pl. 7, figs. 13, 13*a*.

Shell long and slender, wax-yellow on the posterior half between the sutures, light brown on the anterior and the periphery. Nuclear whorls large, two and one-half, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls moderately well-rounded, slightly shouldered at the summit, marked by strong, broad, well-rounded, somewhat protractive, axial ribs, of which twenty occur upon the first to sixth, twenty-two upon the seventh to ninth, and twenty-four upon the penultimate turn. These ribs extend prominently from the summit to the periphery of the whorls, but do not cross the latter. Intercostal spaces very narrow, not more than half the width of the ribs; anterior half between the sutures marked by five, equal and equally spaced, spiral grooves; posterior half marked by two, which equal those on the anterior half in strength but are a little more distantly spaced, and six fine incised lines, which divide the space posterior to the last groove. Sutures somewhat constricted. Periphery of the last whorl well-rounded. Base short, well-rounded, marked by nine, slender, incised, spiral lines, which are successively a little closer spaced from the periphery to the umbilical region. Aperture rhomboid; posterior angle obtuse; outer lip thin, showing the external markings within; columella slender, somewhat curved, and slightly revolute. Length, 12.3; diameter, 1.6 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 160067. Type locality, off San Diego, California.

RANGE. Off San Pedro and San Diego, California, in 15 to 20 fathoms.

Turbonilla callia Dall and Bartsch, 1909
Plate 55, fig. 4

Bulletin 68, United States National Museum, 80; Pl. 7, fig. 4.

Shell elongate-conic, yellowish-white. Nuclear whorls decollated. Post-nuclear whorls moderately well-rounded, ornamented by rather weak, slightly protractive, axial ribs, of which sixteen occur upon the first four of the remaining turns and eighteen upon the rest. Intercostal spaces shallow, double the width of the ribs, marked by two lines of pits, one of which is at the periphery, the other a little posterior to the middle of the whorls and a series of finer incised lines of which seven irregularly spaced ones occur between the two rows of pits and four between the upper row of pits and the summit. Sutures well-impressed. Periphery of the last whorl well-rounded. Base short, well-rounded, marked by several well-incised spiral striations. Aperture subquadrate; posterior angle obtuse; outer lip thin, strongly bent at its anterior margin; columella short, twisted, and slightly revolute. Length, 4.7; diameter, 1.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 205936. Type locality, San Diego, California.

Range. Known only from type locality.

Turbonilla pluto Dall and Bartsch, 1909

Plate 53, fig. 9

Bulletin 68, United States National Museum, 81; Pl. 9, fig. 9.

Shell very robust, chestnut-brown. (Nuclear whorls decollated.) Post-nuclear whorls flattened, moderately shouldered at the summit and scarcely at all contracted at the sutures, marked by rather irregular, low, rounded, variously slanting axial ribs, which are completely eroded on the first four whorls; on the fifth and sixth there are twenty-four, on the seventh and the penultimate there are thirty-eight. Intercostal spaces a little narrower than the ribs, marked by four spiral series of broad, strongly impressed, spiral pits, on the anterior two-thirds of the whorls between the sutures; the posterior third is marked by two closely spaced, well-incised, strong spiral lines, the first of which is about as far posterior to the neighboring pit as the space which separates that from its fellow. Both spiral pits and lines cut strongly into the sides of the ribs and pass feebly over their summits, rendering them somewhat tuberculate. Sutures well-impressed. Periphery of the last whorl marked by a plain band, well-rounded. Base moderately long, well-rounded, marked by very feeble continuations of the axial ribs and six, equal and equally spaced, broad, and deeply incised spiral lines. Aperture pear-shaped; posterior angle acute; outer lip rather thick; columella short, oblique, and somewhat revolute. Length, 7.4; diameter, 2.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206866. Type locality, off San Pedro, California, in 10 fathoms.

Range. Known only from type locality.

Turbonilla jewetti Dall and Bartsch, 1909

Plate 55, figs. 2, *2a*

Bulletin 68, United States National Museum, 82; Pl. 7, figs. 2, *2a.*

Shell short, robust, rose-pink, wax-yellow at tip. Nuclear whorls two and one-half, very small, low, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Post-nuclear whorls flattened, shouldered at the summit, marked by strong, rounded, slightly protractive axial ribs; of which eighteen occur upon the second, twenty upon the third, twenty-two upon the fourth and fifth, twenty-four upon the sixth, and twenty-six upon the penultimate turn. Intercostal spaces about equal to the ribs, strongly impressed, marked by five series of equal and equally spaced spiral pits, the first of which is at the periphery, the last a little farther from the summit than its neighbor. Sutures strongly marked, rendered sinuous by the ribs. Periphery of the last whorl rounded, marked by the feeble continuations of the axial ribs. Base moderately long, well-rounded, marked by eight, unequal and unequally spaced, spiral striations, the two immediately below the periphery being stronger than the rest and somewhat interrupted. Aperture oval; outer lip thick within, columella stout, somewhat twisted and slightly revolute. Length, 5.5; diameter, 1.9 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 153048. Type locality, San Diego, California.

RANGE. San Pedro, California, to San Hipolito Point, Lower California.

Turbonilla dora Bartsch, 1917

Proceedings of the United States National Museum, **52**:649; Pl. 42, fig. 10.

Shell very large, elongate-conic, uniformly pale brown. Nuclear whorls decollated. Postnuclear whorls well-rounded, strongly appressed at the summit, marked on the early whorls by rather strong, almost vertical, axial ribs, which become evanescent on the later turns. Of these ribs eighteen occur upon the first to fourth, twenty upon the fifth, twenty-two upon the sixth, twenty-four upon the seventh, twenty-six upon the eighth, thirty-two upon the ninth, and thirty-four upon the tenth, while upon the penultimate whorl they become too enfeebled to be counted. The spiral sculpture consists of broad pits and feebly incised lines, the posterior fifth between the sutures being marked by six very fine, subequally spaced, spiral striations. These are followed by two stronger lines, which are succeeded by two strongly impressed pits; these are followed by a pit about half as wide as the last two, then by one a little stronger and finer, then by the widest pit of all, which is succeeded by one not quite as broad. These incised spiral lines pass upon and even cross the summit of the enfeebled ribs. Suture moderately constricted. Periphery of the last whorl decidedly inflated. Base moderately long, somewhat inflated, well-rounded, marked by about twenty-five, somewhat wavy, more or less regular, spiral grooves of somewhat varying width, which inclose spaces between them of a width about equal to the grooves, the space between the first of these and the last on the spire is a rather wide band, devoid of sculpture, excepting the fine spiral striations, which cover the entire surface of the shell, in addition to the coarser sculpture already described. Aperture small, subquadrate, posterior angle obtuse; outer lip moderately strong; inner lip oblique, straight and slightly reflected; parietal wall covered by a thick callus. Length, 13.8; diameter, 3.2 mm. (Bartsch.)

Type in United States National Museum, No. 250626. Type locality, off San Diego Bay, California.

Range. Known only from type locality.

Turbonilla ina Bartsch, 1917

Plate 51, fig. 10

Proceedings of the United States National Museum, **52**:649; Pl. 44, fig. 10.

Shell broadly, elongate-conic, bright brown, excepting the nucleus, which is white. Nuclear whorls, two and one-half, planorboid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Post-nuclear whorls feebly rounded, appressed at the summit, marked by rather feeble, almost vertical, axial ribs, of which eighteen occur upon the second and third, twenty upon the fourth and fifth, and twenty-two upon the remaining whorls. Intercostal spaces feebly impressed, about as wide as the ribs, crossed by eleven incised spiral lines between the sutures, of these the fifth is the widest, being fully twice as wide as the third and sixth, which are of equal strength, the remaining are much more slender and also of equal strength. In spacing the first is about as far anterior to the summit as the second is distant from the third, or the fourth from the fifth, or the fifth from the sixth, while the space between the first and second, and those between the sixth and the seventh, are about equal, the spiral markings pass up on the sides of the ribs and the stronger ones tend to cross their summit. Suture moderately constricted. Periphery of the last whorl decidedly angulated. Base short, slightly rounded, marked by the very feeble continuations of the axial ribs, which become evanescent before reaching the middle of the whorls, and thirteen incised spiral lines, which are about equally spaced, the first one below the periphery being a little nearer to its neighbor than the spacing between the rest, the space between the seventh line of the spire and the first incised spiral basal line is a broad, smooth band. Aperture subquadrate, posterior angle obtuse;

outer lip thin, showing the external sculpture within; inner lip almost straight and slightly revolute; parietal wall covered with a thin callus. Length, 6.1; diameter, 1.9 mm. (Bartsch.)

Type in United States National Museum, No. 250625. Type locality, San Diego Bay, California.

Range. Known only from type locality.

Turbonilla ista Bartsch, 1917

Proceedings of the United States National Museum, **52**:650; Pl. 42, fig. 6.

Shell rather large, elongate-conic, light brown. Early whorls light yellow. Nuclear whorls decollated. Post-nuclear whorls appressed at the summit, which is slightly excurved, marked by rather poorly developed, almost vertical, axial ribs, which become obsolete on the later whorls. Of these ribs, eighteen occur upon the second and third, twenty upon the fourth, twenty-two upon the fifth, twenty-four upon the sixth, twenty-six upon the seventh, twenty-eight upon the eighth, thirty upon the ninth, and thirty-two upon the tenth, while upon the penultimate they are too irregular to be counted. Intercostal spaces very feebly impressed, about as wide as the ribs. The spiral sculpture consists of strong and weak incised lines, the strong lines pass strongly upon the sides of the ribs and even cross the summit; the first of these strong lines is about one-fifth of the distance between the summit and the suture anterior to the summit, while the spaces between the first and second, the third and fourth, the fourth and fifth, and the fifth and sixth are almost equal and about two-thirds as wide as that between the second and third; of the finely incised spiral lines eight occur between the first and second, the anterior member of these being much stronger than the other two; there are also three between the second and third, the last two of these being closer spaced than the first two; no fine lines are apparent between the other strong lines. Sutures slightly constricted. Periphery of the last whorl strongly inflated. Base short, well-rounded, marked by the feeble continuations of the axial ribs and twenty-two wavy incised lines, which are of varying width and spacing. Aperture moderately large, subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip oblique, straight, slightly revolute; parietal wall glazed with a moderately thick callus. Length, 12.5; diameter, 2.8 mm. (Bartsch.)

Type in United States National Museum, No. 250627. Type locality, off San Diego Bay, California.

Range. Known only from type locality.

Turbonilla eva Bartsch, 1917

Plate 51, fig. 6

Proceedings of the United States National Museum, **52**: 651; Pl. 44, fig. 6.

Shell small, elongate-conic, of pale-brown ground color, with the incised spiral lines red. Nuclear whorls decollated. Post-nuclear whorls gently rounded, on the posterior three-quarters of the shell sloping more abruptly toward the suture, marked by moderately strong, well-rounded, almost vertical axial ribs, of which twenty-two occur upon the third and fourth, twenty-four upon the fifth, and twenty-six upon the penultimate turn. Intercostal spaces a little narrower than the ribs, crossed by eleven strongly incised spiral grooves, which are of varying width. Of these the fourth, seventh, and eleventh are of equal strength and much wider than any of the rest; the remaining, with the exception of the sixth, which is a mere incised line, are of almost equal strength. In spacing the first is about as far below the summit as that is distant from the second, and these two spaces are a little wider than the spaces between the third and fourth, the fifth and sixth, and the seventh and eighth, which are equal and follow next in strength; the remaining spaces are subequal and a little narrower. Sutures quite strongly constricted. Periphery of the last whorl inflated, well-rounded. Base moderately long, well-rounded, marked by feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base, and thirteen subequally spaced incised spiral lines, of which the first three below the periphery are interrupted by the ribs. Aperture oval, posterior angle obtuse; outer lip very thin; inner lip slightly curved, reflected over and appressed to the base; parietal wall covered with a thin callus. Length, 4.3; diameter, 1.2 mm. (Bartsch.)

TYPE in United States National Museum, No. 250630. Type locality, off San Diego Bay, California.

RANGE. Known only from type locality.

Turbonilla signae Dall and Bartsch, 1909

Plate 55, fig. 1

Bulletin 68, United States National Museum, 83; Pl. 7, fig. 1.

Shell elongate-conic, of very regular outline, wax-yellow, variegated with ashy. (Nuclear whorls decollated.) Post-nuclear whorls very flat, with appressed summits, scarcely at all contracted at the periphery, marked by low, rounded, slightly sinuous, somewhat protractive axial ribs, of which twenty-two occur upon the second, twenty-four upon the third, twenty-six upon the fourth, twenty-eight upon the fifth, thirty upon the sixth, thirty-six upon the seventh, forty-six upon the eighth, and of those remaining, the same number upon the penultimate turn. Intercostal spaces about half as wide as the ribs, marked by six, equal and equally spaced, spiral rows of pits, the last of which is at a little greater distance from the summit than its fellow. Sutures very faintly indicated. Periphery of the last whorl somewhat angulated. Base short, well-rounded, marked by about a dozen fine, wavy, equal and equally spaced, spiral lines. Aperture rhomboidal; outer lip thick; columella moderately strong, slightly sinuous and somewhat reflected. Length, 10.2; diameter, 2.7 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 160210. Type locality, San Pedro, California.

RANGE. Known only from type locality.

Turbonilla mörchi Dall and Bartsch, 1907

Plate 54, figs. 1, 1*a;* Plate 55, figs. 6, 6*a*

Proceedings of the United States National Museum, 33:505; Pl. 45, figs. 1, 1*a*.

Shell broadly elongate-conic, the posterior third of the exposed portion of the whorls on the spire and a narrow area about the umbilical region flesh-colored, the rest of the shell light chestnut-brown. Nuclear whorls two and one-half, small, smooth, forming a depressed helicoid spire which has its axis at right angles to the axis of the succeeding turns and is about one-fifth immersed in the first of them. Exposed portion of the post-nuclear whorls flattened in the middle, posterior fourth sloping gently toward the summit, which is closely appressed to the preceding turn; the anterior portion slopes more abruptly, roundly toward the periphery. The whorls are ornamented by strong rather distantly spaced, moderately acute, slightly protractive axial ribs, of which eighteen occur upon the first three, sixteen on the next three, eighteen on the seventh, and twenty upon the penultimate turn. The ribs weaken slightly and become somewhat flattened as they approach the constricted sutures. Intercostal spaces broad, almost double the width of the ribs, crossed by seven, equal and equally spaced, deeply incised spiral lines, which extend up on the sides of the ribs and feebly across them. The space between the second and third lines appears slightly nodulose on the ribs. Periphery of the last turn angulated, crossed by the continuations of the ribs, which disappear as they pass on to the short and well-rounded base. Base marked by thirteen continuous incised spiral lines of about equal strength which are much more closely spaced near the umbilicus than the periphery, the distance between the succeeding striations diminishing in regular ratio from the periphery to the umbilical area, the first two below the periphery being considerably more distantly spaced than the rest, the spaces inclosed between them being about equal to the space inclosed between the spiral lines on the spire. Aperture subquadrate, posterior angle acute, outer lip thin, showing the external sculpture within; columella slender, oblique, somewhat twisted and slightly revolute. (Dall and Bartsch.)

Type in United States National Museum. Type locality, Long Beach, California.

Range. Redondo Beach to San Diego, California.

Turbonilla aragoni Dall and Bartsch, 1909

Plate 53, figs. 12, 12*a*

Bulletin 68, United States National Museum, 85; Pl. 9, figs. 12, 12*a*.

Shell elongate-conic, anterior half of whorls chestnut-brown, the rest flesh-colored. Nuclear whorls two, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is one-fifth immersed. Post-nuclear whorls well-rounded, slightly contracted at the suture, appressed at the summit, marked by acute vertical axial ribs, of which sixteen ocur upon the first to seventh, twenty upon the eighth, and twenty-six upon the penultimate turn. Intercostal spaces about two and one-half times as wide as the ribs, marked by fine lines of growth and seven, strongly incised, spiral grooves, and numerous, exceedingly fine, spiral striations. Sutures slightly contracted. Periphery of the last whorl slightly angulated, marked by a narrow plain band. Base short, well-rounded, marked by fifteen well-incised and numerous very fine spiral lines. Aperture rhomboidal, posterior angle obtuse; outer lip thin, showing the external markings within; columella slender, slightly curved. Length, 7.2; diameter, 2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206867. Type locality, off New Monterey, Monterey Bay, California, in 29 fathoms.

Range. Known only from type locality.

Turbonilla recta Dall and Bartsch, 1909

Plate 55, figs. 12, 12*a*

Bulletin 68, United States National Museum, 85; Pl. 7, figs. 12, 12*a*.

Shell broadly conic, milk-white. Nuclear whorls small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Post-nuclear whorls slightly rounded, somewhat exserted, weakly shouldered at the summit, marked by slender, protractive, axial ribs, of which twenty-two occur upon the second, twenty-four upon the third, twenty-eight upon the fourth and fifth, and thirty upon the penultimate whorl. Intercostal spaces about as wide as the ribs, marked by eight, equal and equally spaced, spiral series of pits. Sutures strongly marked, crenulated by the ribs. Periphery of the last whorl well-rounded, appearing as a broad plain band, marked only by the feeble continuations of the axial ribs. Base short, well-rounded, marked by ten, equal and almost equally spaced, spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, strongly curved, slightly revolute, with a weak fold at its insertion. Length, 3.6; diameter, 1.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162635. Type locality, Point Abreojos, Lower California.

Range. San Diego, California, to Point Abreojos, Lower California.

Turbonilla weldi Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 86; Pl. 8, fig. 11.

Shell large, chestnut-brown with a broad peripheral light band, and a light area about the columella. (Nuclear whorls decollated.) Postnuclear whorls well-rounded, somewhat overhanging, strongly contracted at the suture, appressed at the summit, marked by moderately strong, rounded, slightly retractive axial ribs, of which twenty-four occur upon the third to fifth, twenty-eight upon the sixth, and about thirty-five upon the penultimate turn, upon which they are less regular than on the others. Intercostal spaces a little wider than the ribs, marked by eight, broad, deep, spiral series of pits which are subequal, excepting the three above the peripheral one, the median on which is much narrower than the rest. Sutures strongly constricted. Periphery and base of the last whorl inflated, well-rounded, marked by the feeble continuations of the axial ribs, a broad line of pits immediately below the periphery, and seven, equal and equally spaced, broad, well-incised, spiral lines. Aperture large, broadly oval, posterior angle acute; outer lip very strong curved, thin, showing the external markings within; columella slender, twisted, curved, and slightly revolute. Length, 8.8; diameter, 2.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206868. Type locality, University of California Station 14, off Point Fermin, California.

Range. Known only from type locality.

Turbonilla nereia Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 86; Pl. 8, figs. 1, 1*a*.

Shell broadly conic, pale yellow, with a broad dark wax-yellow band, which extends over a little more than one-half the distance from the middle of the whorls to the summit, between the sutures. A secondary of the same color extends from a little posterior to the periphery to the middle of the base. Nuclear whorls small, two and one-half, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which they are very slightly immersed. Post-nuclear whorls flattened in the middle, slightly rounded at the summit and at the periphery, ornamented by well-rounded, strong, almost vertical, axial ribs, which become weakened toward the summit. These ribs are scarcely indicated on the first and second whorls; upon the third and fourth there are twenty, upon the remaining (excepting the penultimate whorl, which has twenty) there are eighteen. Intercostal spaces about double as wide as the ribs, marked by nine spiral series of pits, all of which pass strongly upon the sides of the ribs, but do not cross their summits. Of these pits the peripheral one and the three anterior to the one at the summit are stronger than the rest; the space separated by the second and third below the summit is a little wider than the rest, and the pits biting in the ribs render these somewhat nodulous at this place. Sutures well-impressed. Periphery of the last whorl well-rounded. Base moderately long, well-rounded, marked by the continuations of the axial ribs which extend feebly to the umbilical region, and about eight weakly incised spiral lines, those nearest the periphery being somewhat interrupted by the ribs. Aperture suboval; posterior angle acute; outer lip thin, showing the external markings within; columella slender, slightly twisted, and very oblique. Length, 5.8; diameter, 1.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206869. Type locality, San Pedro, California.

Range. San Pedro to San Diego, California.

Turbonilla antestriata Dall and Bartsch, 1907

Plate 54, figs. 4, 4*a*

Proceedings of the United States National Museum, 33:506; Pl. 45, figs. 4, 4*a*.

Shell large and strong, light brown. Nuclear whorls two and one-half, small, smooth, forming a depressed rounded helicoid spire, which projects somewhat beyond the left side of the outline of the spire of the later whorls and has its axis at a right angle to the axis of these, being about one-fourth immersed in the first turn. Post-nuclear whorls slightly rounded, ornamented by low, rounded, narrow, vertical, axial ribs which become decidedly flattened and enfeebled near the summit of the turns; there are nine of these ribs on the second, twenty upon the fifth, and twenty-eight upon the penultimate post-nuclear turns. Intercostal spaces about double the width of the ribs, shallow, rounded, crossed by six, equal and equally spaced, strongly incised, spiral lines which extend stronger upon the sides of the ribs and feebly over their summits. In addition to this sculpture, the spire is marked by many fine lines of growth and many fine spiral striations between the incised lines. Sutures well-marked, simple. Periphery of the last whorl subangulated, marked by the feeble continuations of the axial ribs, which disappear at the periphery. Base short, marked by eleven continuous, equal, strong, incised, spiral lines, which are more closely spaced above the umbilical area than at the periphery; the space between the first basal incised line and the first supra-peripheral one being a little wider than the space inclosed between the spiral lines on the spire. Aperture subquadrate, outer lip thin, showing the external sculpture within; columella almost straight and vertical, slightly revolute. (Dall and Bartsch.)

TYPE in United States National Museum, No. 168867. Type locality, U.S. Bureau of Fisheries Steamer "Albatross" Station 3192, Esteros Bay, California.

RANGE. Esteros Bay to San Diego, California.

Turbonilla antemunda Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 88; Pl. 8, figs. 15, 15*a*.

Shell broadly conic, milk-white, with a moderately broad pale-yellow band at the periphery and another at the middle of the whorls between the sutures of the same width. Nuclear whorls two and three-fourths, helicoid, having its axis at right angles to that of the succeeding turn, in the first of which it is about one-third immersed. Post-nuclear whorls moderately rounded, appressed at the summit, strongly contracted at the periphery, somewhat overhanging, ornamented by well-developed, narrow axial ribs, which become decidedly enfeebled toward the summit. Of these there are sixteen upon the first to fourth, eighteen upon the fifth to seventh, twenty upon the eighth, twenty-two upon the ninth and penultimate whorl. Intercostal spaces about two and one-half times as wide as the ribs, ornamented with a double series of spiral markings, the first of which consists of seven strongly incised and subequally spaced pits between the sutures, the third and fourth of which above the periphery bound the color band and are a little closer spaced than the rest. The first one below the summit passes over the axial ribs and gives them a truncated appearance; the others pass up the sides of the ribs but do not cross them. The second series of spiral markings consist of very fine lines, of which three occur between the peripheral series of pits and the second two occur between th second and third, one between the fourth and fifth, two between the sixth and seventh. In addition to this sculpture there are many microscopic lines of growth and microscopic spiral striations. Sutures well-marked. Periphery of the last whorl somewhat angulated, marked by the feeble extension of the axial ribs. Base short, well-rounded, smooth, excepting the fine lines of growth and exceedingly fine, weakly incised spiral striations, among which about nine equal and equally spaced are a trifle stronger than the rest. Aperture rhomboid; outer lip thin, showing the external sculpture within; columella moderately strong and slightly revolute. Length, 6.9; diameter, 2.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 168866. Type locality, off Santa Rosa Island, California.

Range. Santa Rosa Island and Santa Catalina Island, California.

Turbonilla tenuicula Gould, 1853

Plate 54, figs. 3, *3a*

Boston Journal of Natural History, **6**:383; Pl. 14, fig. 15.

T. gracillima, lanceolata, nitida, cerina, infra suturam fuscescens; anfr. 10 planulatis, tabulatis, longitudinaliter ad 20-plicatis, striis numerosis volventibus leviter secatis; basi modo spiraliter strista; apertura anguta, ovata; labro acuto. (Gould.)

Shell small, elongated lanceolate, turreted; rather solid, shining, wax-yellow, a little dusky below the suture; whorls ten, flat, slightly shouldered above, marked by about twenty direct longitudinal folds, the summits of which are cut by numerous fine revolving striae, deeper in the interstices, which also extend over the base of the shell, though the folds terminate at the periphery or are extended in delicate furrows. Aperture narrow ovate, lip sharp; revolving striae apparent in the aperture. Length, three-tenths of an inch; diameter one-twentieth of an inch. (Gould.)

Type in ? Type locality, Santa Barbara, California.

Range. Monterey, California, to Point Abreojos, Lower California.

Turbonilla virgo Carpenter, 1865

Annals and Magazine of Natural History, series 3, **15**:396. *Bulletin 68,* United States National Museum; Pl. 8, fig. 4.

C. testa parva, alba, gracili, stylina; anfr. nucl. ii, decliviter sitis, margines spirae subparallelos haud superantibus; norm. vii, subrotundatis, suturis distinctis; costulis radiantibus circ. xviii, angustis, acutioribus, saepe attingentibus, circa peripheriam haud subito evanidis, interstitiis subaequalibus alte spiraliter sulcatis, sulci circ. viii, latera costarum crenulantibus, costas haud superantibus; basi valde rotundata, curta, haud sculpta; axi lacunato; peritremate vix continuo; columella recta. Long., .18; long. spir., .14; lat., .05 poll. (Carpenter.)

Shell elongate-conic, milk-white. Nuclear whorls small, two forming a depressed helicoid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls moderately rounded, slightly shouldered at the summit, weakly contracted at the periphery, ornamented by slender, sinuous, protractive, axial ribs, of which twenty-four occur upon the first and second, twenty-two upon the third, twenty upon the fourth to sixth, twenty-two upon the seventh and penultimate turn. Intercostal spaces about one and one-half times as wide as the ribs, well-impressed, marked by six strongly impressed series of pits which extend up on the sides of the ribs but do not cross them; the peripheral and the third posterior to this are of equal strength and stronger than the rest. The space between the third and fourth above the periphery is a little wider than that between the others, which are about equally spaced. The space between the summit and the first spiral line below it is about equal to about double the space included between the other spirals. A finely incised line divides it into equal areas. Sutures strongly impressed, rendered wavy by the ribs. Periphery well-rounded, marked by the feeble continuations of the axial ribs and a few distantly spaced spiral striations. Aperture oval; posterior angle obtuse; outer lip thin, columella moderately strong, sinuous and slightly reflected. (Bartsch.)

Type in United States National Museum, No. 73993. Type locality, Santa Barbara, California.

Range. Known only from type locality.

Described as *Chemnitzia virgo*.

Turbonilla callimene Bartsch, 1912

Proceedings of the United States National Museum, 42:271; Pl. 36, fig. 7.

Shell moderately large, elongate-conic, flesh colored. Nuclear whorls decollated. Post-nuclear whorls rather high between the sutures, moderately shouldered at the summit, marked by numerous, well-developed, almost vertical, axial ribs, of which eighteen occur upon the second and third, twenty upon the fourth, twenty-four upon the fifth, twenty-eight upon the sixth, thirty upon the seventh, and thirty-four upon the penultimate turn. Intercostal spaces strongly impressed, about as wide as the ribs. In addition to the axial sculpture, the whorls are crossed by five strong lines of pits, which are distributed over the anterior two-thirds between the sutures, the intercostal spaces on the posterior third being smooth. The anterior three of these five lines of pits are of equal strength and equally spaced; the posterior two are weaker and a little closer together than the rest, the second one being a little farther distant from the median than that is from its neighbor anterior to it. Periphery and the somewhat attenuated base of the last whorl well-rounded, marked by the feeble continuations of the axial ribs and by nine incised, spiral lines, which vary considerably in strength and spacing. The first two of these, below the five already described, are of about the same strength as those immediately above the suture; the remainder are not so wide and less regular. Aperture moderately long, ovate; posterior angle acute; outer lip thin; inner lip oblique, somewhat curved, and slightly revolute; parietal wall glazed with a thin callus. Length, 7.2; diameter, 2.2 mm. (Bartsch.)

Type in United States National Museum, No. 211554. Type locality, San Diego Bay, California.

Range. Known only from type locality.

Turbonilla canfieldi Dall and Bartsch, 1907

Plate 53, figs. 3, *3a;* Plate 66, figs. 4, 4*a*

Proceedings of the United States National Museum, **33**:504; Pl. 47, figs. 4, 4*a*.

Shell slender, elongate-conic, with the posterior half of the exposed portion of the whorls on the spire white and the anterior half chestnut-brown, base white. Nuclear whorls two and two-thirds, large, smooth, forming a depressed helicoid spire whose axis is at right angles to the axis of the succeeding turn; not immersed, and extending slightly beyond the outline of the spire on both sides. Post-nuclear whorls very slightly rounded, weakly roundly shouldered at the summit and very moderately contracted at the periphery, ornamented by the very strong, broad, low, rounded, almost vertical axial ribs of which there are twenty-two upon the first, twenty-four upon the antepenultimate, and twenty-eight upon the penultimate turn. These ribs extend prominently to the summit and crenulate the subchanneled sutures. Intercostal spaces narrow, not more than half the width of the ribs, crossed by nineteen incised spiral lines, which are of almost equal width and subequally spaced with the following exceptions: the seventh, eleventh, and the last three above the periphery are much wider, appearing as quadrangular pits in the intercostal spaces, the eleventh falling on about the middle of the exposed portion of the whorl on the spire, and the seventh about half-way between this and the summit. Periphery and base of the last whorl well-rounded, the latter marked by the feeble continuations of the axial ribs which gradually disappear after crossing the periphery, and about sixteen subequally spaced incised spiral lines. Aperture oval, somewhat effuse anteriorly, columella oblique, somewhat twisted with a weak oblique fold a little anterior to its insertion. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196229. Type locality, off Del Monte, Monterey, California.

RANGE. Known only from type locality.

Turbonilla almo Dall and Bartsch, 1909

Plate 53, figs. 8, 8*a*

Bulletin 68, United States National Museum, 95; Pl. 9, figs. 8, 8*a*.

Shell slender, light-brown, wax-yellow at tip. Nuclear whorls very small, two and one-half, planorboid, having their axis at right angles to that of the succeeding turns, in the first of which they are slightly immersed. First post-nuclear whorls almost smooth, the second with a mere indication of ribs, well-rounded. The remaining post-nuclear whorls somewhat overhanging, appressed at the summit, well-rounded, marked by moderately developed, rounded, retractive axial ribs, of which about 20 occur upon all but the penultimate whorl; upon this there are 22. Intercostal spaces a little wider than the ribs, marked by seven deep pits of unequal width and unequal spacing. Base well-rounded, marked by the feeble continuations of the axial ribs, and nine, irregular, wavy, incised, spiral lines, the first two of which below the periphery are interrupted. Aperture ovate; posterior angle acute; outer lip thin, showing the external markings within; columella slender, very oblique, somewhat flexuose and revolute, with a slight fold at its insertion. Length, 4.6; diameter, 1.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 162633. Type locality, off San Diego, California.

RANGE. Known only from type locality.

Turbonilla grippi Bartsch, 1912

Proceedings of the United States National Museum, **42**:270; Pl. 36, fig. 9.

Shell very elongate-conic, light chocolate-brown. (Nuclear whorls decollated.) Post-nuclear whorls well-rounded, slightly shouldered about one-third of the distance between the sutures, anterior to the summit, marked by rather strong, decidedly retractive, axial ribs, of which 20 occur upon the second, 18 upon the third to sixth, 20 upon the seventh, 26 upon the eighth to tenth, and 30 upon the penultimate whorl; upon the last five whorls they are less regular in size and spacing than on the preceding. Intercostal spaces about twice as wide as the ribs on the first seven whorls, averaging a little less in width upon the remaining; the intercostal spaces are strongly impressed, and marked with six strongly impressed series of spirally spaced pits, the first one below the summit being a little further from the summit than from its neighbor; between these spiral pits occur finer incised lines, of which there are 10 between the summit and the first strong pit, one each between the first and second, and second and third, two between the third and fourth, three between the fourth and fifth, and two between the fifth and sixth; the strong incised lines pass up on the sides of the ribs, constricting the ribs where they meet them; the fine lines are not apparent upon the ribs. Sutures strongly constricted. Periphery of the last whorl well-rounded. Base short, well-rounded, marked by about 20, very slender, incised, spiral lines. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip slightly curved, oblique, reflected, but not adnate to the base; parietal wall covered with a thin callus. Length, 11; diameter, 2.7 mm. (Bartsch.)

Type in United States National Museum, No. 229011. Type locality, off San Diego, California.

Range. Known only from type locality.

Turbonilla eucosmobasis Dall and Bartsch, 1907

Plate 54, figs. 8, 8*a*

Proceedings of the United States National Museum, **33**:507; Pl. 45, figs. 8, 8*a*.

Shell quite large, of very regular outline, creamy white. Nucleus rather small, composed of two and one-half whorls, helicoid with much depressed spire, somewhat obliquely about one-third immersed in the first of the succeeding turns, the axis of the nuclear spire being almost at a right angle to the axis of the later whorls. Post-nuclear whorls moderately rounded, widest a little above the suture, sloping gently toward the summit and more abruptly toward the base, ornamented by moderately strong, rounded, somewhat flexuous, axial ribs, of which about 18 appear upon the second, 20 upon the seventh, 22 upon the eighth, and 27 upon the penultimate whorl. Intercostal spaces only moderately deep, a little wider than the ribs, marked by six, strong, incised, spiral lines, which extend up on the sides of the ribs and frequently pass over their summits; the uppermost or posterior one of these incised lines is least pronounced, the second one above the suture, and the third one about half again as far apart as the remaining, which are equally spaced. In addition to these the shell is marked by many faint wavy spiral striations between the deep ones. Sutures plain, well-defined. Base of the last whorl very short, well-rounded, marked by the faint continuations of the axial ribs and about 15, well-defined, more or less equally spaced, deep, spiral striations with fainter ones between them as on the exposed portion of the whorls of the spire; the first deep basal spiral striation and the one above the suture are some little distance apart and mark a plain band excepting the fainter sculpture. Aperture quite large, subquadrate; columella short, somewhat twisted, revolute. (Dall and Bartsch.)

Type in United States National Museum, No. 162679. Type locality, Station 2902, off Santa Barbara, California.

Range. San Luis Obispo to San Diego, California.

Turbonilla auricoma Dall and Bartsch, 1903

Plate 53, figs. 5, 5*a*

Memoirs of the California Academy of Sciences, 3: 274; Pl. 1, figs. 4, 4*a*. *Bulletin 68,* United States National Museum, 100; Pl. 9, figs. 5, 5*a*.

Shell slender, attenuated, brown, lighter on the early whorls, becoming dark on the last. Nuclear whorls two and one-half, large, helicoid, not immersed, projecting somewhat beyond the outline of the spire, their axis being at a right angle to the axis of the later whorls; post-nuclear whorls at first somewhat rounded, later flattened, marked by well-developed, rather strong, retractive axial ribs, of which 16 appear upon the third and fourth, 18 upon the fifth to eighth, 20 upon the ninth, 22 upon the tenth, and 30 upon the penultimate turn. Intercostal spaces a little wider than the ribs on all but the penultimate whorl; on this they are somewhat narrower, crossed between the sutures by nine subequally spaced, almost equally strong, spiral lines of pits, which pass up on the sides of the ribs but do not cross their summit. Periphery and base of the last whorl inflated, well-rounded, marked by the continuations of the axial ribs, which extend almost undiminished to the umbilical area and eight equally strong and almost equally spaced, well-incised spiral lines. Aperture ovate; posterior angle acute; outer lip thin, showing the external sculpture within, the spiral markings appearing as red threads; columella slender, rounded, reflected, the reflection giving the base an umbilicated appearance; the parietal wall covered by a strong callus. Length, 7.2; diameter, 1.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 106511. Type locality, Scammons Lagoon, Lower California.

Range. San Pedro, California, to Scammons Lagoon, Lower California. Fossil: Post-Pliocene—San Diego, California.

Turbonilla castanea Keep, 1888

Plate 53, figs. 1, 1*a;* Plate 66, fig. 7

West Coast Shells, 52; fig. 33. *Bulletin 68,* United States National Museum, 101; Pl. 9, figs. 1, 1*a.*

Shell is somewhat larger than that of the last (*C. torquata* Gould), and is of a chestnut color. Its eight or ten whorls are marked with numerous fine ribs, and though so small, it is a beautiful shell. (Keep.)

Shell elongate-conic, chestnut-brown. Nuclear whorls very small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls flattened in the middle, slightly excurved at the summit, where they are faintly shouldered and somewhat contracted at the periphery, marked by rather irregular, strong, low, rounded, retractive, axial ribs, of which 20 occur on the third, 22 on the fourth, 24 on the fifth to seventh, 26 on the eighth; 28 on the ninth, and about 50 upon the penultimate whorl; upon this they are very irregular. Intercostal spaces less wide than the ribs, shallow, marked by a series of spiral pits, which vary in width and number on the various whorls; on the early ones there are eight, on the ninth there are twelve, while on the penultimate there are sixteen between the peripheral series and the summit. Sutures well-marked. Periphery and base of last whorl inflated, marked by the continuations of the axial ribs, which extend almost undiminished to the umbilical area; and about twenty, subequal and subequally spaced, incised, spiral lines. Aperture pear-shaped; posterior angle acute; outer lip thin, showing the external sculpture within; chestnut-brown; columella slender, strongly curved, and slightly revolute; parietal wall covered by a thick callus. Length, 10.5; diameter, 2.5 mm. (Bartsch.)

Specimens in United States National Museum, No. 160224. Specimens, San Diego, California. Type locality, San Diego, California.

Range. San Pedro to San Diego, California.

Turbonilla wickhami Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 106; Pl. 10, fig. 9.

Shell elongate-conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, contracted at the sutures, with a moderately broad, sloping shoulder at the summit, marked by well-developed, rounded, very regular, slightly protractive axial ribs, of which 20 occur upon the second and 22 upon the remaining, excepting the penultimate whorl, which has 32. Intercostal spaces a little wider than the ribs, marked by seven series of spiral pits, of which the third below the summit is almost twice as wide as the rest. Sutures moderately constricted.

Periphery of the last whorl well-rounded. Base short, well-rounded, marked by the continuations of the axial ribs, which extend to the umbilical area, and 11 incised spiral lines, of which those immediately below the periphery are somewhat interrupted and wider than the rest. Aperture rhomboidal; posterior angle acute; columella rather stout, revolute. Length, 8; diameter, 2.1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206870. Type locality, University of California Station 32, off Santa Catalina Island, California.

Range. Known only from type locality.

Turbonilla adusta Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 108; Pl. 10, figs. 12, 12*a.*

Shell robust, pale brown. (Nuclear whorls decollated.) Post-nuclear whorls flattened, slightly exserted at the summit, where they are moderately squarely shouldered, marked by well-developed, rounded, slightly retractive, axial ribs, of which 20 occur upon the second and third, 22 upon fourth and fifth, 24 upon the sixth of the remaining turns, and 28 upon the penultimate whorl. Intercostal spaces equaling the ribs, crossed by a double series of spiral pits, five are strong and of equal strength, one of which is at the periphery, the other a little posterior to it, the third occupies the middle of the space between the sutures, while the other two divide the space posterior to this into three equal areas. The fine lines are arranged in the following manner: between the second and third supra-peripheral pit, two fine lines; between the third and fourth, one; between the fourth and fifth, one; between the fifth and summit, two. Sutures well-impressed, rendered sinuous by the ribs. Periphery of the last whorl marked by a broad band, crossed by the extensions of the axial ribs, which continue feebly over the well-rounded base to the umbilical area. In addition to these ribs, the base is marked by eleven incised spiral lines, the three immediately below the periphery being somewhat interrupted; the remaining are equal and equally spaced. Aperture ovate; posterior angle acute; columella slender, somewhat curved and reflected. Length, 5.7; diameter, 1.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206880. Type locality, San Diego, California.

Range. Known only from type locality.

Turbonilla castanella Dall, 1908

Plate 53, fig. 7

Bulletin 68, United States National Museum, 102; Pl. 9, fig. 7.

Shell very large, stout and heavy, chestnut-brown. Nuclear whorls decollated. Post-nuclear whorls well-rounded, ornamented by many broad, flattened, more or less regular and evenly retractive axial ribs, of which about 22 appear upon the third, 26 upon the fifth and 40 upon the seventh whorl. On the penultimate and antepenultimate whorls they are more or less irregular in form, number, and spacing. Intercostal spaces much narrower than the ribs. The spiral sculpture consists of eight deep, quite regularly spaced lines of pits, which are very pronounced in the intercostal spaces and on the sides of the ribs, but do not appear to cross their summits except on the penultimate and last whorl. Sutures well-defined, simple. Periphery and base of the last whorl evenly rounded, the latter ornamented by the prolongation of the axial ribs and quite a number of continuous well-impressed spiral lines with faint spiral striation between them. Aperture suboval, somewhat effuse anteriorly, posterior angle obtuse (outer lip fractured, very thick) ; columella strong, slightly curved, and strongly revolute, with a weak, very oblique, internal fold near its insertion; parietal wall and umbilical region covered by a weak callus. Columella and extreme anterior portion of the aperture white. Length, 13.5; diameter, 3.7 mm. (Dall.)

TYPE in United States National Museum, No. 74000. Type locality, Monterey, California.

RANGE. Known only from type locality.

Subgenus MORMULA A. Adams, 1854

Turbonilla regina Dall and Bartsch, 1909

Plate 56, fig. 1

Bulletin 68, United States National Museum, 112; Pl. 11, fig. 1.

Shell very large, elongate-conic, slender, pale-chestnut. (Nuclear whorls decollated.) Post-nuclear whorls well-rounded, appressed at the summit, moderately constricted at the periphery, marked at irregular intervals by strong varices and by very regularly narrow, low, rounded, slightly protractive, axial ribs, of which 16 occur upon the first and second, 18 upon the third, 22 upon the fourth, 24 upon the fifth to seventh, 30 upon the eighth and ninth, 36 on the tenth, 40 on the eleventh and the penultimate whorl. Intercostal spaces about one and one-half times as wide as the ribs, marked by six well-incised spiral lines, which extend strongly upon the sides of the ribs and weakly over them; the space between these lines is marked by numerous exceedingly fine, spiral striations. Sutures constricted. Periphery of the last whorl slightly angulated, marked by an incised spiral line. Base short, well-rounded, marked by the feeble continuations of the axial ribs and numerous very fine, closely spaced, wavy, spiral striations. Aperture rhomboidal; posterior angle obtuse; columella strong, almost straight, decidedly revolute. Length, 19.6; diameter, 5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162686. Type locality, Santa Rosa Island, California.

Range. Santa Rosa to Catalina Island, California.

Turbonilla eschscholtzi Dall and Bartsch, 1907

Plate 56, fig. 8; Plate 54, fig. 10

Proceedings of the United States National Museum, 33:513; Pl. 45, fig. 10.

Shell large, elongate-conic, brown, having three obscure bands of dark brown, one of which is at the summit, another at the periphery, while a third is halfway between these on the exposed portion of the whorl of the spire. Nuclear whorls decollated. Post-nuclear turns moderately rounded, ornamented by low, rounded, rather distantly spaced, slightly protractive axial ribs, which become weakened and somewhat flattened as they approach the appressed summit, and many fine lines of growth both on the ribs and in the intercostal spaces. In addition to the axial sculpture the whorls are crossed by twelve deeply incised, somewhat irregularly spaced, spiral lines, the raised spaces between which are again divided by many fine striae. All the spiral markings pass over the intercostal spaces and the ribs. Periphery of the last whorl obscurely angular, marked by the feeble continuations of the ribs, which vanish immediately below the periphery and the usual fine lines of growth and spiral striation. Base rather short, well-rounded, brown, with a narrow whitish band about the umbilicus, marked by closely spaced continuous wavy spiral striation, which varies in strength, several finer striae alternating with the stronger. Aperture subquadrate, outer lip thin, showing four narrow dark-brown bands within, upon a lighter background—these are the three already referred to—and a fourth one on the base adjoining the periphery; columella almost vertical, slightly twisted and revolute. Length, 13.3; diameter, 4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 196241. Type locality, Carter Bay, British Columbia.

Range. Port Simpson to Vancouver Island, British Columbia.

Turbonilla catalinensis Dall and Bartsch, 1909

Plate 56, figs. 10, 10*a*

Bulletin 68, United States National Museum, 113; Pl. 11, figs. 10, 10*a*.

Shell elongate-conic, very slender. Nuclear whorls two and one-half, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls well-rounded with appressed summits, moderately constricted at the sutures, marked at irregular intervals by strong varices; axial ribs somewhat sinuous, low, well-rounded, weakening toward the summit; 16 upon the first, 18 upon the second to eighth, 24 upon the ninth and tenth, 26 upon the eleventh and twelfth, 28 upon the thirteenth and penultimate turn. Intercostal spaces as wide as the ribs, marked by nine, equally spaced, spiral lines, which pass up on the sides of the ribs, but do not cross their summits; space between the incised spiral lines is marked by exceedingly fine spiral striations. Periphery of last whorl well-rounded. Base short, well-rounded, marked by the feeble continuations of the axial ribs, and seven, well-incised, spiral striations. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external markings within; as well as four color bands, one of which is at the periphery, another midway between the periphery and summit, the third at the summit, the fourth on the middle of the base; in addition to these bands there are four strong spiral folds, two on the base and two on the lip, which show deeply within the aperture; columella slender, somewhat twisted and slightly revolute. Length, 16.5; diameter, 4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 160147. Type locality, off Catalina Island, California.

Range. Known only from type locality.

Turbonilla pentalopha Dall and Bartsch, 1903

Plate 56, figs. 3, 3*a*

Memoirs of the California Academy of Sciences, **3**: 282; Pl. 1, figs. 1, 1*a*.

Shell elongate-conic, chocolate-brown. Nuclear whorls small, three, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls rounded on the earlier and flattened on the later turns, marked by strong, rounded, somewhat flexuous, slightly retractive, axial ribs, which are scarcely at all expressed on the first, and of which there are eighteen upon the first and second, twenty upon the third and fourth, twenty-two upon the fifth, twenty-four upon the sixth, and twenty-eight upon the penultimate turn. Intercostal spaces as wide as the ribs, marked by six, equal and equally spaced, spiral series of pits which pass up on the sides of the ribs but do not cross them. Sutures well-impressed. Periphery and base of the last whorl well-rounded, marked by the continuations of the axial ribs and seven, equally spaced, spiral striations agreeing in strength with those on the spire. The first spiral line above and below the periphery are a little farther apart than the rest. Aperture large, oval; posterior angle acute; outer lip thin, showing the external sculpture within; provided with five strong, spiral cords, the anterior one of which is a little closer to its neighbor than the rest, which are equally spaced; columella moderately strong, curved, and revolute. Length, 8.5; diameter, 2.3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 46501. Type locality, San Diego, California.

RANGE. San Pedro, California, to Todos Santos Bay, Lower California.

Turbonilla tridentata Carpenter, 1865

Plate 56, figs. 12, 12*a;* Plate 54, fig. 9

Journal de Conchyliologie, **13** (3d. series, **5**) :147, 1865.

Ch. t. (quoad genus) magna compacta, latiore; castanea, interdum fasciis pall dioribus; anfr. nucleosis 3 helicoideis, apice conspicuo, marginibus spirae rectis parum superantibus; normalibus ii subplantibus, suturis distinctis; costis rectis acutis, interdum 19, interdum 24 tenus, haud attingentibus, circa peripheriam haud subito evanidis; interstitiis undates, eleganter spiraliter, sulcatis; sulculis circiter 8–10, costis haud superantibus; apertura subquadrata; labio intus tridentato; columella tortuosa; basi rotundata. Long., .43; long. spir., .35; lat., .12 poll. (Carpenter.)

Shell large, broad, chestnut-colored, obscurely banded. Nuclear whorls three, helicoid, about one-third immersed, scarcely extending beyond the margin of the spire, their axis being at a right angle to the axis of the later whorls. Post-nuclear whorls slightly convex, somewhat contracted at the periphery and slightly shouldered at the summit; traversed by about twenty to twenty-four, strong, well-rounded, somewhat oblique, axial ribs, which continue faintly over the decidedly angular periphery of the last whorl and the base to the umbilical region; these ribs are considerably enfeebled on the last whorl of old shells and frequently become almost obsolete on these. The exposed portion of the whorls is traversed by five spiral grooves, which appear most prominently in the shallow and broad intercostal spaces, and less so on the ribs; these deep spiral lines are regularly spaced, leaving a broader interval on the middle of the exposed portion of the whorl; the base of the last whorl is likewise ornamented by spiral grooves, but here they appear less developed than on the spire. In addition to this the entire surface of the shell is marked by numerous very fine, somewhat wavy, spiral and axial striae, which show most prominently on the last whorl and base, and give the shell a very minutely reticulated secondary sculpture. At regular intervals the whorls are marked by thick callous varices, which are usually of a lighter color than the remainder of the shell. Aperture large, subquadrate; posterior angle acute; outer lip thin, having three strong internal lirations, joining the whitish, short, straight, revolute columella at a little less than a right angle. By transmitted light two spiral light-color-bands become apparent on the inside of the lip, each of which is bordered by a zone of a darker color than the remaining shell. The general color effect of the exterior is that of a flesh-colored shell, covered by a dark epidermis, which is stretched tight over the ribs, permitting the lighter color beneath to shine through it at their summits. Length, 11.1; diameter, 3.2 mm. (Bartsch.)

Type in United States National Museum, No. 15215b. Type locality, Monterey, California.

Range. Monterey to San Diego, California.

Turbonilla ambusta Dall and Bartsch, 1909

Plate 56, fig. 13

Bulletin 68, United States National Museum, 115; Pl. 11, fig. 13.

Shell medium-sized, slender, chestnut-brown. (Nuclear whorls decollated.) Post-nuclear whorls moderately rounded, appressed at the summit, slightly contracted at the periphery, marked by strong, rounded, slightly protractive axial ribs, of which sixteen occur upon the first and second, eighteen upon the third to seventh, the eighth has a strong varix, twenty upon the ninth, and twenty-two upon the tenth. On the penultimate whorl they are decidedly enfeebled. Intercostal spaces a little wider than the ribs, marked by ten, equal and equally incised, spiral lines, the space between which is crossed by numerous exceedingly fine spiral striations. Periphery and base of the last whorl well-rounded, marked by fine lines of growth and numerous very fine spiral striations. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; also color bands, of which a narrow white one occurs at the periphery, which is bounded on both sides by a brown band equaling it in width; another narrow brown band bordered on each side by a narrow white area occurs halfway between the periphery and the summit; columella slender, slightly curved and somewhat revolute. Length, 10; diameter, 2.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 152751. Type locality, off San Pedro in 10 fathoms.

Range. San Pedro to San Diego, California.

Turbonilla lordi E. A. Smith, 1880

Plate 56, figs. 4, 4*a;* Plate 54, figs. *7, 7a*

Annals and Magazine of Natural History, series 5, **6**:288.

Shell subulate, whitish, banded at the sutures with light-brown, with a narrow line of the same color around the middle of the whorls. The latter 12–13, slightly convex, about twice as broad as high, longitudinally ribbed and spirally striated in the interstices. Costæ only slightly oblique, scarcely arcuate, rather broader than the interstices, about 18–20 on each volution, those upon the last terminating abruptly at the periphery. Last whorl finely concentrically striated below the middle. Base pale brown, with a single white zone. Aperture a little longer than broad and a trifle effuse at the base. Columella simple, white, nearly erect. Length, 13; diameter, 3¾ mm. (E. A. Smith.)

Type in British Museum. Type locality, Vancouver Island, British Columbia.

Described as *Chimnitzia lordi.*

Turbonilla heterolopha Dall and Bartsch, 1909

Plate 56, fig. 9

Bulletin 68, United States National Museum, 118; Pl. 11, fig. 9.

Shell small, slender, chestnut-brown, with wax-yellow apex. Nuclear whorls two and one-half, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is one-fourth immersed. Post-nuclear whorls flat, appressed at the summit, not constricted at the periphery, forming a spire almost straight, uninterrupted outline. Axial sculpture consists of very broad, low, rounded, slightly retractive, axial ribs, which are absent on the first turn but of which twenty occur upon the second to fourth, twenty-eight upon the fifth and penultimate turn. Intercostal spaces very narrow, marked by six spiral lines of pits. Sutures poorly defined. Periphery and base of the last whorl well-rounded, marked by the feeble continuations of the axial ribs and seven, equally spaced, incised, spiral lines. Aperture oval; posterior angle acute; outer lip thin, showing the external markings within; re-enforced on the inside by four or five slender, equally spaced, spiral cords; columella strong, somewhat twisted. Length, 5.5; diameter, 1.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 153065. Type locality, San Diego, California.

Range. San Diego, California, to San Hipolito Point, Lower California.

Turbonilla periscelida Dall and Bartsch, 1909

Plate 56, figs. 6, 6*a*

Bulletin 68, United States National Museum, 119; Pl. 11, figs. 6, 6*a.*

Shell pupiform, milk-white, shining. Nuclear whorls small, two, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Postnuclear whorls flattened, slightly contracted at the sutures, appressed at the summit, with a strong, sloping shoulder which extends over the posterior fourth of the space between the sutures, marked by strong, vertical axial ribs, of which about fourteen occur upon all the whorls. These ribs become flattened and decidedly expanded on the shoulder. Intercostal spaces about three times as wide as the ribs, shallow, smooth. Sutures slightly contracted. Periphery of the last whorl somewhat attenuated, base well-rounded, smooth. Aperture oval; somewhat effuse anteriorly; posterior angle acute; outer lip re-enforced by three, broad, internal spiral lirations, two of which are posterior to the periphery and the other immediately below it; columella decidedly twisted and somewhat revolute; re-enforced by the base, provided with a very strong, oblique fold at its insertion; parietal wall covered by a thin callus. Length, 3.2; diameter, 1 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 163266. Type locality, United States Bureau of Fisheries Station 2901, off Santa Rosa Island, California.

RANGE. Known only from type locality.

Subgenus BARTSCHELLA Iredale, 1917

Turbonilla laminata Carpenter, 1856

Annals and Magazine of Natural History, series 3, 396. *Bulletin 68,* United States National Museum; Pl. 12, fig. 16.

D. testa satis elevata, rufo-fusca, fasciis pallidioribus interdum cincta; anfra. nucl. ii, helicoideis, valde decliviter sitis, margines spirae subrectos haud superantibus; norm. viii., subrotundatis, suturis impressis; costis spiralibus rotundatis, in spira iv, aliisque suturalibus vix rotundatis, interstitiis minoribus impressis; super eas laminis rantiantibus acutioribus circ. xxx, circa basim rotundatum tenuiter continuis, liris spiralibus basalibus circ. viii, obtusis, columellan versus subflexuosam obsoletis; peritremate continuo; labio appresso. Long., .25; long. spir., .18; lat., .07 poll. (Carpenter.)

Shell broadly conic, wax-yellow at the tip, chestnut-brown on the last whorl, columellar area white. Nuclear whorls two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls inflated, strongly rounded, moderately contracted at the suture, marked by very regular, rounded, strong, almost vertical axial ribs, of which eighteen occur upon the first, twenty-four upon the second, twenty-six upon the third, twenty-eight upon the fourth and fifth, thirty upon the sixth and seventh, and about forty upon the penultimate turn. Intercostal spaces a little wider than the ribs, crossed by five spiral series of broad, deep pits, which cause the five intermediate areas to appear as broad, raised bands, which are about as wide as the ribs, and render their junction with the ribs tuberculate. Sutures strongly impressed. Periphery of the last whorl well-rounded. Base moderately long, marked by the faint continuations of the axial ribs, and about ten spiral lirations, which are narrower and less strongly developed about the umbilical area. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external markings within; columella strongly curved and completely reenforced by the base. This specimen, described and figured No. 946b United States National Museum, came from San Pedro, California. (Bartsch.)

Type locality, Santa Barbara, California.

RANGE. San Pedro, California, to Point Abreojos, Lower California.

Turbonilla arata Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 125; Pl. 12, fig. 12.

Shell large and rough. (Nuclear whorls decollated.) Post-nuclear whorls somewhat inflated and overhanging, appressed at the summit, well-rounded, with the greatest convexity on the anterior third between the sutures, marked by strong, narrow, rounded, well-raised, retractive, axial ribs, of which eighteen occur upon the first four, twenty upon the fifth, twenty-two upon the sixth and seventh, twenty-four upon the eighth, twenty-six upon the ninth, and twenty-eight upon the penultimate turn. Intercostal spaces about twice as wide as the ribs, marked by very deep pits, which leave the intervening spaces as strongly elevated cords, nine of which occur between the sutures. Of these cords, the second and fifth below the summit and the first above the periphery are of equal width and wider than the rest; the first, which forms the summit, and the three posterior to the one at the periphery, are again equal width; the third and fourth below the summit are a little more slender than the rest; the pit at the periphery and those that bound the fifth cord are a little wider than the rest; the first and second below the summit and the second and third pit above the periphery are equal, and those between the third and fourth cords are also equal. Sutures well-impressed. Periphery of the last whorl inflated. Base well-rounded, marked by the feeble continuations of the axial ribs and eight, almost equal, incised, spiral lines. Aperture large, oval; posterior angle acute; outer lip somewhat flaring in the middle; columella slender, curved, and slightly revolute. Length, 10.2; diameter, 2.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206890. Type locality, off Santa Catalina Island, California.

Range. Known only from type locality.

Subgenus Dunkeria Carpenter, 1856

Turbonilla swani Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 129; Pl. 12, figs. 9, 9*a*.

Shell elongate, pupoid, semi-transparent, light yellow. Nuclear whorls at least two, forming a low helicoid spire, whose axis is almost at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls inflated, very strongly rounded, appressed at the summit, contracted at the periphery, marked by strong, decidedly-curved, lamellar, protractive axial ribs, of which eighteen occur upon all but the last whorl, the latter has twenty. Intercostal spaces twice as wide as the ribs, marked by fifteen, almost equal and almost equally spaced, spiral series of pits. Sutures constricted. Periphery and base of the last whorl well-rounded, the latter marked by the feeble continuations of the axial ribs, and about twenty feeble, very wavy, incised spiral lines. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, curved, with the posterior two-thirds re-enforced by the base. Length, 5; diameter, 1.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 160485. Type locality, San Pedro, California.

Range. Known only from type locality.

Genus **ODOSTOMIA** Fleming, 1817[1]

Shell with a sinistral apex, usually short, few-whorled, subconic or ovate, with a single columella fold, which varies in strength and sometimes is not apparent at the aperture. The sculpture varies from smooth to lamellar axial ribs and spiral keels. (Bartsch.)

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[1] For descriptions of new species, received while this volume was in press, see Appendix, pp. 286–292.

Of the forty subgenera now recognized under *Odostomia* nineteen have been found represented on the west coast of America. (Bartsch.)

TYPE. *Turbo plicatus* Montagu.

DISTRIBUTION. Universal, from low water to deep water. Fossil: Eocene to Pleistocene.

Subgenus SALASSIELLA Dall and Bartsch, 1909

Odostomia laxa Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 133; Pl. 13, fig. 8.

Shell pupiform, milk-white. Nuclear whorls at least two, small, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about two-thirds immersed. Post-nuclear whorls inflated, contracted at the suture, and strongly roundedly shouldered at the summit, marked by lamellar, flexuose axial ribs, which are only feebly expressed on the first. On the second there are eighteen, on the third twenty, twenty-two upon the fourth, and twenty-eight upon the penultimate turn, upon which there is a strong varix. Intercostal spaces about one and one-half times as wide as the ribs, well-impressed. Sutures constricted. Periphery and base of the last whorl well-rounded, marked by the continuations of the axial ribs. Aperture broadly oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, strongly curved and slightly revolute, provided with a weak fold at its insertion. Length, 4.3; diameter, 1.7 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 106512. Type locality, Scammons Lagoon, Lower California.

RANGE. San Diego, California, to Scammons Lagoon, Lower California.

Odostomia richi Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 133; Pl. 13, figs. 6, 6*a*.

Shell small, broadly conic, white. Nuclear whorls three, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls strongly rounded, moderately contracted at the suture, broadly tabulated at the shoulder, marked by strong, lamellar, axial ribs, of which sixteen occur upon the first, fourteen upon the second and third, and eighteen upon the penultimate turn. Intercostal spaces somewhat wider than the ribs, strongly impressed. Periphery of the last whorl marked by a broad, low keel. Base with a strongly raised tumescence about the umbilical area, the space between which and the peripheral keel appears slightly concave. The axial ribs continue weakly over the base. A strong varix appears on the last whorl, between two axial ribs, and extends from the summit to the umbilical chink. Aperture suboval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella strong, straight, and decidedly revolute; parietal wall covered by a thin callus. Length, 3; diameter, 1.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 160484. Type locality, San Pedro, California.

Range. Known only from type locality.

Subgenus Besla Dall and Bartsch, 1909

Odostomia callimorpha Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 136; Pl. 13, fig. 5.

Shell very small, pupiform, milk-white. Nuclear whorls completely immersed. Post-nuclear whorls flattened, slightly contracted at the sutures, moderately shouldered at the summit, marked by strong, depressed, rounded, almost vertical, axial ribs, of which twenty-two occur upon all but the first whorl, which is smooth. Intercostal spaces about as wide as the ribs, crossed by three slender, spiral lirations on the anterior half of the whorls between the sutures. Sutures subchanneled. Periphery and base of the last whorl well-rounded, marked by the continuations of the axial ribs, which extend almost undiminished to the umbilical area, and five equal slender, spiral lirations on the posterior half of the base. Aperture broadly oval, posterior angle acute; outer lip thin, showing the external sculpture within; columella strongly curved, slightly revolute, re-enforced on its posterior half by the base, provided with a strong fold at its insertion. Length, 1.5; diameter, 0.6 mm. (Dall and Bartsch.)

New name for *Chrysallida pumila* Carpenter, 1866 (*Proceedings of the California Academy of Sciences,* 3: 219); not *Odostomia pumila* A. Adams, 1861.

Type in United States National Museum, No. 15565. Type locality, San Pedro, California.

Range. Known only from type locality.

Subgenus CHRYSALLIDA Carpenter, 1856

Odostomia astricta Dall and Bartsch, 1907

Plate 57, fig. 1

Proceedings of the United States National Museum, **33**:514; Pl. 46, fig. 1.

Shell elongate-conic, bluish-white. Nuclear whorls decollated. Post-nuclear whorls very slightly rounded, separated by deeply channeled sutures. In this species the vertical ribs exceed the four spiral keels in strength, their junction forming elongated tubercles, the long axis of which coincides with the spiral keels. The vertical ribs, of which there are sixteen upon all of the turns, slant decidedly backward toward the aperture. They are rather distantly spaced and the spaces inclosed between them and the spiral keels are deep oblong pits, the long axis of which coincides with the spiral sculpture. Periphery of the last whorl marked by a deep, wide channel across which the ribs extend feebly to the first subperipheral keel. Base rather long and well-rounded, marked by seven, rather narrow, slender, spiral keels, which successively decrease in strength from the periphery to the umbilical area, the anterior ones being only faintly indicated; the spaces which separate the keels are about twice as wide as the keels and are crossed by many very slender raised vertical threads. Aperture oval, outer lip rather thick, columella twisted, re-enforced by the attenuated base and provided with a moderately strong fold at its insertion; parietal wall covered by a strong callus. Length, 2.9; diameter, 1.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196280. Type locality, Monterey, California.

RANGE. Known only from type locality.

Odostomia cooperi Dall and Bartsch, 1907

Plate 57, fig. 7

Proceedings of the United States National Museum, **33**:514; Pl. 46, fig. 7.

Shell broadly conic, white. Nuclear whorls smooth, largely obliquely immersed in the first of the succeeding turns above which only about half of the last turn projects. Post-nuclear whorl moderately rounded, slopingly shouldered at the summit, the shoulder bearing the first of the four stronger tuberculate spiral ridges. The connections which join the tubercles in the spiral series are a little more strongly developed than those which link them vertically, the spaces inclosed between them being deep squarish pits. The tubercles are very prominent and rounded, there are about sixteen upon the second, twenty upon the third, and twenty-six upon the penultimate turn. The axial series slants retractively from the posterior suture. Sutures deep and broad, considerably wider than the spaces between the keels. Periphery of the last whorl deeply channeled, the channel marked by a weak extension of the axial bars which terminate at the first supraperipheral keel. Base prolonged, well-rounded, marked by seven strong, moderately-raised, spiral keels which, like the channels that separate them, diminish regularly in width from the periphery to the umbilical area; the last, the eighth, immediately behind the columella, being less distinct and considerably broader than the rest. The channels between the keels are about equal to the keels in width and are crossed by numerous very slender raised threads, which extend up on the sides of the keels but do not cross them. About five of these threads fall in the space between two tubercles on the spire, in the first supraperipheral groove. Aperture oval, large, effuse anteriorly, posterior angle obtuse, outer lip rather thick, not showing the external sculpture within; columella somewhat twisted, revolute anteriorly, re-enforced by the attenuated base, and provided with a weak fold at its insertion; parietal wall covered by a callus, which joins the columella with the posterior angle of the aperture and renders the peristome almost complete. Length, 3.1; diameter, 1.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162771. Type locality, Monterey, California.

Range. Known only from type locality.

Odostomia cincta Carpenter, 1864

Plate 58, figs. 2, *2a*

Supplementary Report, British Association for the Advancement of Science, 659. *Bulletin 68,* United States National Museum, 152; Pl. 15, figs. 2, *2a.*

Passing toward *Mumiola.* Radiating sculpture very faint. (Carpenter.)

Shell elongate-ovate, vitreous. Nuclear whorls smooth, deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, marked by vertical axial ribs, which are strongest near the summit, becoming much enfeebled as they pass to the suture. Of these ribs eighteen occur upon the second and third and twenty upon the fourth whorl. In addition to the ribs the whorls are marked by four, broad, strong, spiral keels which form nodules at their junction with the ribs. On the last whorl, the axial sculpture is obsolete on the anterior half between the sutures. Sutures subchanneled. Periphery of the last whorl marked by a strong keel. Base well-rounded posteriorly, effuse anteriorly, marked by six low, spiral cords, the two nearest the umbilical area being very faint. Aperture oval, decidedly effuse anteriorly; posterior angle acute; outer lip rendered sinuous by the spiral cords, thin, showing the external sculpture within; columella slender, very long, almost straight, reflected, re-enforced by the base, provided with a weak fold at its insertion. Length, 3; diameter, 1.5 mm. (Bartsch.)

TYPE in United States National Museum, No. 15730. Type locality, Santa Barbara, California.

RANGE. Santa Barbara to Pacific Beach, California.

Described as *Chrysallida cincta*.

Odostomia clementina Dall and Bartsch, 1909

Plate 58, figs. 5, 5*a*

Bulletin 68, United States National Museum, 149; Pl. 15, figs. 5, 5*a*.

Shell elongate-conic, vitreous. Nuclear whorls obliquely immersed in the first post-nuclear turn, above which only the tilted edge of the last volution projects, which is marked by five slender spiral threads. Post-nuclear whorls well-rounded, moderately contracted at the sutures, strongly slopingly shouldered at the summit, marked by strong, somewhat retractive axial ribs, of which fourteen occur upon the first and second, eighteen upon the third and penultimate turn. In addition to the axial ribs, the whorls are marked by four spiral cords between the sutures, of which the second one anterior to the summit marks the angle of the shoulder. On the last two whorls the first basal is apparent in the strongly contracted sutures. Periphery of the last whorl marked by a spiral groove. Base well-rounded, somewhat attenuated anteriorly, marked by five distant spiral cords, which grow successively weaker from the periphery to the umbilical region. The broad spaces that separate these cords are marked by numerous, fine, raised, axial threads. Aperture broadly oval; posterior edge obtuse; outer lip thin, showing the external sculpture within, rendered sinuous by the spiral cords; columella moderately strong, slightly reflected, re-enforced by the base, provided with a slender fold at its insertion. Length, 2.3; diameter, 1.1 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 162043. Type locality, San Clemente Island, California.

RANGE. Known only from type locality.

Odostomia dicella Bartsch, 1912

Proceedings of the United States National Museum, 42:274; Pl. 36, fig. 1.

Shell small, elongate-ovate, somewhat translucent, bluish-white. Nuclear whorls small, very obliquely immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, marked by four spiral cords between the sutures, the three posterior of which are nodulous on the early whorls; the fourth, or suprasutural one being smooth. On the last whorl the nodules are obsolete. Of these cords, the one at the summit is the weakest and the second below it the strongest. The spaces between the spiral keels are about half as wide as the keels and rather shallow. In addition to the spiral sculpture the whorls are marked by slender, almost axial riblets, which render the three posterior keels on the early whorls nodulose at their intersections. Of these riblets, about eighteen occur upon the second and twenty-two upon the third whorl. On the fourth, which is the penultimate, the grooves between the keels are crossed by slender axial threads. Sutures strongly constricted. Periphery of the last whorl marked by a narrow, deep sulcus. Base moderately long, well-rounded, marked by five spiral cords, which grow successively weaker between the periphery and the umbilical area. Grooves between the sutural cords equal, crossed by numerous, slender, axial threads, which cause the spaces between the threads and cords to appear as minute pits. Aperture moderately large, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip moderately long, strong, somewhat curved, and reflected over and adnate to the base, provided with a slender fold at its insertion; parietal wall covered with a thin callus. Length, 3; diameter, 1.5 mm. (Bartsch.)

Type in United States National Museum, No. 21162. Type locality, San Diego, California.

Range. Known only from type locality.

Odostomia euglypta E. K. Jordan, 1921

Proceedings of the United States National Museum, **58**:2; Pl. 1, fig. 1.

Shell minute, thin but fairly solid, rather broad; nuclear whorls large, inflated, somewhat eroded, evidently with quite strong spiral sculpture; postnuclear whorls four, well-rounded; sutures quite prominent; spiral ridges between the sutures four, the lower one the strongest, crossed by numerous, fairly strong, axial ribs which become weaker as they approach the outer lip; junction of transverse ribs and spiral ridges marked by prominent, blunt, rounded nodules; base moderate, with seven flattish spiral bands, the upper ones the strongest, without any transverse ribs; aperture ovate, slightly produced below; columella with a fairly sharp fold; margin of outer lip scalloped, showing the external sculpture within. Color gray. Length 2.1; breadth, 1.2 mm. (E. K. Jordan.)

Type in United States National Museum, No. 334780. Type locality, Trinidad, California.

Range. Known only from type locality.

Odostomia eugena Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 147; Pl. 14, figs. 1, 1*a*.

Shell elongate-conic, milk-white. Nuclear whorls at least two, small, smooth, obliquely half immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, moderately contracted at the suture, well-shouldered at the summit, marked by strong, very retractive axial ribs, of which fourteen occur upon the first, sixteen upon the second, eighteen upon the third to fifth, and twenty-two upon the penultimate whorls. In addition to these ribs the whorls are marked by four strong spiral cords between the sutures which render their junction with the ribs tuberculate. The spaces enclosed by the ribs and cords form oval pits, the long axis of which coincides with the spiral sculpture. Sutures channeled. Periphery of the last whorl marked by a moderately broad groove, which is crossed by the continuation of the axial ribs which terminate at the posterior edge of the first basal keel. Base of the last whorl well-rounded, marked by six spiral keels, which grow successively weaker from the periphery to the umbilical region. The broad spaces between these keels are crossed by slender, raised, axial threads. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella stout, curved, strongly reflected and re-enforced by the base, provided with a strong fold at its insertion. Length, 4.3; diameter, 1.5 mm. (Dall and Bartsch.)

Type in United States National Museum No. 127545. Type locality, San Hipolito Point, Lower California.

Range. San Pedro, California, to San Hipolito Point, Lower California.

Odostomia helga Dall and Bartsch, 1909

Plate 59, figs. 8, 8*a*

Bulletin 68, United States National Museum, 166; Pl. 17, figs. 8, 8*a*.

Shell conic, milk-white. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding whorls, above which only a portion of the last two volutions project. Post-nuclear whorls moderately rounded, slightly contracted at the sutures, feebly shouldered at the summits, marked between the sutures by four, broad, low, spiral bands which are separated by narrow, deeply incised lines. In addition to these bands, the first three and one-half whorls are marked by feeble axial ribs, which are best developed near the summit of the whorls and scarcely reach the suture. The junction of the ribs and cords form weak nodules. Sutures strongly impressed but not channeled. Periphery of the last whorl well-rounded, marked by a low spiral cord. Base strongly rounded posteriorly, attenuated anteriorly, marked by seven spiral cords, which grow successively weaker from the periphery toward the umbilical region and are separated by slender, deeply-incised spiral lines. Aperture large, broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, curved, reflected, and re-enforced by the base; provided with an oblique fold at its insertion. Length, 4.2; diameter, 2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 60905. Type locality, San Diego, California.

Range. San Pedro, California, to Coronado Islands.

Odostomia heterocincta Bartsch, 1912

Proceedings of the United States National Museum, 42:274; Pl. 36, figs. 4, 4*a*.

Shell moderately large, elongate-conic, with decidedly channeled sutures, white. Nuclear whorls at least two, forming a depressed helicoid spire, which is obliquely, almost one-half immersed in the first of the succeeding turns. Post-nuclear whorls moderately rounded, marked by strong, decidedly retractive, axial ribs and, on the first four turns, by three spiral cords which equal the ribs in strength; the middle one of these three cords is a little nearer that at the summit than to the one anterior to it. Of the ribs, sixteen occur upon all the whorls. The intersection of the ribs and spiral cords form strong, compressed tubercles, the long axes of which coincide with the spiral sculpture. The spaces between the cords and ribs are well-rounded, strongly impressed pits. The median cord on the first four whorls is a little stronger than the other two. On the penultimate whorl a slender, spiral cord makes its appearance between the median and the supraperipheral cord, which on the last turn, immediately behind the aperture, attains a strength equal to that of the spiral cord at the summit. Entire surface of the spire marked by numerous, very fine, incremental lines. Periphery of the last whorl marked by a deep channel across which the axial ribs extend feebly. Base of the last whorl well-rounded, marked by four strong spiral keels, which are subequally spaced and grow somewhat weaker successively from the peripheral to the umbilical area. Immediately anterior to the last of these spiral keels there is a single, slender, raised, spiral thread. The spaces between the spiral keels are crossed by slender continuations of the axial ribs and very fine lines of growth. Aperture oval; outer lip fractured; inner lip oblique, strong, slightly reflected upon and adnate to the base, provided with a moderately strong fold at its insertion; parietal wall glazed with a thin callus. Length, 3.2; diameter, 1.3 mm. (Bartsch.)

TYPE in United States National Museum, No. 212033. Type locality, United States Bureau of Fisheries Station 2932, in twenty fathoms, off San Diego, California.

RANGE. Known only from type locality.

Odostomia lucca Dall and Bartsch, 1909

Plate 58, figs. 8, 8*a*

Bulletin 68, United States National Museum, 148; Pl. 15, figs. 8, 8*a*.

Shell broadly conic, milk-white. Nuclear whorls large, obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects, which shows five strong spiral threads. Post-nuclear whorls well-rounded, strongly contracted at the sutures, appressed at the summits with a sloping shoulder that extends from the summit to the second spiral keel, marked by narrow, decidedly elevated, retractive axial ribs, of which sixteen occur upon the first and second, eighteen upon the third, and twenty-two upon the penultimate turn. In addition to the ribs, the whorls are marked between the sutures by four spiral keels, which equal the ribs in strength and render them decidedly nodulous at their junction. The spaces inclosed by the ribs and cords are well-impressed rectangular pits whose axis coincides with the spiral sculpture. Sutures subchanneled, showing a portion of the first basal keel in the last two volutions. Periphery of the last whorl marked by a broad channel, crossed by the axial ribs, which terminate at the posterior edge of the first basal keel. Base of the last whorl well-rounded, marked by five, subequal and subequally spaced, spiral lirations, separated by broad spaces, which are marked by numerous prominent axial threads. Aperture broadly oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella moderately strong, curved, re-enforced by the base, provided with a weak fold at its insertion; parietal wall covered with a thin callus. Length, 4; diameter, 1.4 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206898. Type locality, San Diego, California.

RANGE. Monterey to San Diego, California.

Odostomia montereyensis Dall and Bartsch, 1907

Plate 57, fig. 4; Plate 59, fig. 6

Proceedings of the United States National Museum, 33:516; Pl. 46, fig. 4.

Shell broadly conic, milk-white to subdiaphanous. Nuclear whorls smooth, largely immersed in the first of the succeeding turns, above which only half of the last whorl projects. Post-nuclear whorls separated by broad, deep sutures; well-rounded between the sutures, where they are ornamented by four, strongly tuberculate, spiral ridges; the spiral connections between the tubercles are equal to the axial connections or ribs, of which sixteen appear upon the second, eighteen upon the thirtieth, and twenty upon the penultimate whorl. The spaces inclosed between the axial ribs and the spiral connections which join the rounded tubercles are deep, squarish pits. The axial ribs extend strongly across the deep peripheral channel and stop at the first subperipheral keel. Base moderately long, well-rounded, marked by five equal and subequally spaced, well-raised, strong, spiral keels, and a sixth, much broader, low, and rounded at the columella margin. The grooves between the keels are equal to the width of the keels near the periphery, but diminish in breadth successively from the periphery to the umbilical area. They are crossed by numerous, slender, raised, axial threads, which extend up on the sides of the spiral keels, but do not cross them. There are about five of these threads between each two ribs in the first subperipheral channel; aperture oval, somewhat effuse anteriorly; posterior angle acute; columella re-enforced by the attenuated base, against which it appears like a thickened callus, provided with a moderately strong oblique fold at its insertion; parietal wall covered by a thick callus, which joins the columella with the posterior angle of the aperture. Length, 3; diameter, 1.3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196281. Type locality, off Del Monte, Monterey Bay, California.

RANGE. Monterey Bay to San Luis Obispo, California.

Odostomia oldroydi Dall and Bartsch, 1909

Plate 58, figs. 1, 1*a*

Bulletin 68, United States National Museum, 150; Pl. 15, fig. 3.

Shell elongate-ovate, vitreous. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which projects the tilted edge which is marked with five raised spiral lirations. Post-nuclear whorls somewhat inflated, well-rounded, moderately contracted at the sutures, strongly slopingly shouldered at the summit, ornamented with somewhat retractive axial ribs, of which fourteen occur upon the first, sixteen upon the second, eighteen upon the third, and twenty upon the penultimate turn. In addition to the axial ribs, the whorls are marked by four spiral cords between the sutures which are as strong as the ribs and render them strongly nodulous at their junction. The second of these ribs below the summit marks the angle of the shoulder. The spaces inclosed by the ribs and cords are strongly impressed oblong pits, the long axis of which coincides with the spiral sculpture. Sutures strongly constricted. Periphery of the last whorl marked by a spiral groove, crossed by the continuations of the axial ribs, which terminate at the posterior edge of the first basal keel. Base well-rounded posteriorly, somewhat attenuated anteriorly, marked by six almost equal spiral keels, which are less developed about the umbilical area. The deep grooves between these keels are crossed by numerous very slender, raised, axial threads. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; rendered decidedly sinuous by the spiral cords; columella moderately strong, decidedly reflected anteriorly, provided with a fold at its insertion. Length, 3.5; diameter, 1.7 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 162765. Type locality, San Diego, California.

RANGE. San Pedro, California, to Coronado Islands, Mexico.

Odostomia oregonensis Dall and Bartsch, 1907

Plate 59, fig. 3; Plate 57, figs. 10, 10*a*

Proceedings of the United States National Museum, 33:516; Pl. 46, figs. 10, 10*a*.

Shell elongate-conic, slender, subdiaphanous to milk-white. Nuclear whorls immersed, the last one only being visible. This is somewhat tilted and marked by three, strong, narrow, spiral keels and many slender, raised, axial threads which cross the grooves between the keels. Post-nuclear whorls well-rounded, slopingly shouldered at the summit and separated by constricted sutures, ornamented by almost equal and equally-spaced spiral keels and axial ribs between the sutures on the spire. There are four spiral keels on the first, second, and third whorls, six on the fourth, and seven upon the penultimate whorl. The first of these keels is on the shoulder of the whorl near the summit and is somewhat less developed than the rest. The axial ribs are best developed on the early whorls, where they extend equally strong from the summit to the periphery; on the antepenultimate and penultimate turns they become somewhat enfeebled from the middle of the whorl between the sutures to the periphery. There are about sixteen of these ribs on the first, eighteen on the third, twenty upon the fourth, and twenty-two upon the penultimate turn. The intersections of the ribs and spiral keels form low elongated tubercles, the long axis of which coincides with the spiral sculpture. The meshes inclosed by the keels and ribs are deeply-impressed squarish pits. Periphery and base of the last whorl well-rounded, the latter somewhat inflated and marked by six spiral cords which are successively closer spaced and a little less strongly developed from the periphery to the umbilical area. The channels between the cords are crossed by many, very slender, raised, vertical threads. Aperture oval, slightly effuse anteriorly; outer lip thin; columella re-enforced on its posterior two-thirds by the attenuated base, free and somewhat revolute anteriorly; parietal wall glazed by a thin callus. Length, 3.3; diameter, 1.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 107690. Type locality, Cumshewa Inlet, Queen Charlotte Islands, British Columbia, in ten fathoms.

RANGE. Queen Charlotte Islands, British Columbia, to Monterey, California.

Odostomia pulcherrima Dall and Bartsch, 1909

Plate 59, fig. 7

Bulletin 68, United States National Museum, 164; Pl. 17, fig. 7.

Shell large, elongate-oval, vitreous. Nuclear whorls small, smooth, deeply obliquely immersed in the first post-nuclear turn, above which only the tilted edge of the last volution projects. Post-nuclear whorls strongly rounded, decidedly contracted at the sutures and strongly shouldered at the summit. The first is marked by four slender spiral cords and numerous, exceedingly fine, axial threads. The next three have twenty, strong, rounded, axial ribs, which terminate at the posterior edge of the fourth keel, leaving this smooth. On the last whorl the ribs are decidedly enfeebled, being replaced by numerous axial threads. The spiral sculpture consists of four strong cords between the sutures, the three which cross the ribs form strong nodules at their junction with them, while the supra-peripheral one is smooth. Suture strongly impressed, slightly channeled. Periphery and base of the last whorl well-rounded, marked by eight spiral keels, which grow successively weaker from the periphery to the umbilical region, the last three being very fine. Spaces separating the cords equal to them, crossed by numerous slender, axial threads. Aperture irregularly ovate, posterior angle obtuse; outer lip strong, rendered decidedly sinuous by the axial ribs; columella short, decidedly twisted, strongly curved, reflected, re-enforced by the base and provided with a deep-seated fold at its insertion; parietal wall glazed with a thin callus. Length, 5; diameter, 2.3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206900. Type locality, Terminal Island, San Pedro, California.

RANGE. Known only from type locality.

Odsotomia pulcia Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 160; Pl. 16, figs. 10, 10*a*.

Shell small, ovate, vitreous. Nuclear whorls deeply, very obliquely immersed in the first of the post-nuclear whorls, above which only the tilted edge of the last volution projects, which is marked by five slender spiral threads. Post-nuclear whorls well-rounded, strongly contracted at the sutures and shouldered at the summits, marked by very strong, decidedly retractively curved, axial ribs, of which sixteen occur upon the first, eighteen upon the second, and twenty upon the penultimate turn. In addition to the axial ribs, the whorls are marked between the sutures by four very broad, low, spiral bands, which are separated by mere impressed lines, and which render the axial ribs feebly tuberculated. Suture subchanneled. Periphery of the last whorl marked by a narrow deep groove, which is not crossed by the axial ribs. Base well-rounded, crossed by six spiral cords, which grow decidedly weaker and closer spaced from the periphery to the umbilical area, the spaces between them being crossed by numerous, slender, axial threads. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella stout, strongly reflected anteriorly, provided with a weak fold at its insertion. Length, 2.2; diameter, 1.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162763. Type locality, San Pedro, California.

Range. Known only from type locality.

Odostomia ritteri Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 146; Pl. 14, figs. 8, 8*a*.

Shell elongate-conic, milk-white. Nuclear whorls at least two, smooth, deeply obliquely immersed in the first of the succeeding turns, above which only a portion of the last two turns project. Post-nuclear whorls moderately rounded, strongly constricted at the sutures, slopingly shouldered at the summit, ornamented by strong, retractive, axial ribs, of which fourteen occur upon the first, sixteen upon the second to fourth, eighteen upon the fifth, and twenty upon the penultimate turn. In addition to the axial ribs, the whorls are marked by spiral cords between the sutures, which are a little more than half as strong as the ribs and of which three occur upon the first three whorls and four upon the succeeding turns; the second one below the summit marking the angle of the long sloping shoulder. Junction of ribs and cords strongly nodulous; the spaces enclosed between them are deep squarish pits. Sutures strongly channeled. Periphery of the last whorl marked by a broad groove that is crossed by the continuations of the axial ribs which terminate at the posterior margin of the first basal keel. Base of the last whorl well-rounded, marked by six spiral cords which are of unequal strength, separated by grooves of different widths, which are crossed by fine axial threads. Aperture oval, effuse anteriorly; posterior angle obtuse; outer lip rendered sinuous by the cords, thin, showing the external sculpture within; columella slender, strongly reflected, provided with a fold at its insertion. Length, 4.5; diameter, 1.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206896. Type locality, University of California, Station 30, off Catalina Island.

Range. Catalina Island to San Diego, California.

Odostomia cumshewaensis Bartsch, 1921

Proceedings of the Biological Society of Washington, **34**: 34.

Shell broadly elongate, conic, milk-white. Nuclear whorls, at least two, obliquely immersed in the first of the postnuclear whorls, above which about two-thirds of the nuclear spire projects. Postnuclear whorls strongly rounded, constricted at the periphery, marked by strong, retractively slanting axial ribs, of which sixteen occur upon the first, eighteen upon the second, twenty-two upon the third, and the penultimate turn. These ribs are crossed by four strong cords which are a little wider than the ribs and render the axial ribs tuberculated, the first row of tubercles at the summit being decidedly smaller than the two that succeed it. All three of these have the tubercles strongly, evenly rounded. The fourth, immediately above the periphery, however, has the spiral cord stronger than the axial ribs, and appears as an almost uninterrupted cord with feebler tubercles. The pits enclosed between the ribs and spiral cords are strongly impressed and rounded. Suture strongly constricted, a part of the first basal cord showing at the suture of the last two turns. Periphery well rounded, marked by a strong spiral cord. Base moderately long, marked by five spiral cords on the anterior three-fourths, which become succeedingly narrower and feebler, the last two being indicated merely by the incised lines that separate them. The anterior fourth of the base is smooth, excepting incremental lines. The spaces between the spiral cords on the base are crossed by fine axial threads. Aperture very broadly oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip strongly curved, reflected over and appressed to the base, a very narrow chink remaining behind the lip, indicating a very slight umbilicus; parietal wall covered by a thick callus. Length, 2.7; diameter, 1.2 mm. (Bartsch.)

Type in United States National Museum, No. 340860. Type locality, Cumshewa Inlet, British Columbia.

This species suggests *Odostomia (Chrysallida) astricta* Dall and

Bartsch from Monterey, but differs from it in being more conic, with the whorls more rounded and having the base shorter and more rounded, as well as in minor details of sculpture. (Bartsch.)

Odostomia sapia Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 167; Pl. 18, figs. 3, 3*a*.

Shell oval semitranslucent. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which is marked by five slender spiral threads. Post-nuclear whorls amply rounded, slightly constricted at the sutures and appressed at the summits, marked by six spiral cords between the sutures, of which the second and third below the summit are very narrow, occupying together about as much space as one of the other cords. These cords are separated by grooves which almost equal them. Axial sculpture reduced to feeble indications of ribs, which are best shown near the summit of the whorls, where they render the spiral keels feebly nodulous. About twenty-two of these ribs appear upon the penultimate whorl. Periphery and base of the last whorl well-rounded, marked by seven spiral keels, which grow successively weaker from the periphery to the umbilical area. Channels separating the cords narrow, well-incised, crossed by numerous slender axial threads. Aperture large, broadly ovate, posterior angle acute; outer lip thin; columella moderately strong, curved, slightly reflected; parietal wall glazed with a thin callus. Length, 1.8; diameter, 1.1 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 162775. Type locality, San Diego, California.

RANGE. Known only from type locality.

Odostomia thalia Bartsch, 1912

Proceedings of the United States National Museum, 42:275; Pl. 36, fig. 3.

Shell small, elongate-ovate, bluish-white, semitranslucent. Nuclear whorls obliquely immersed in the first of the succeeding turns, above which half of the tilted edge of the last volution only projects. Post-nuclear whorls well-rounded, feebly shouldered at the summit, marked by very slender, poorly developed, decidedly retractive, axial ribs, of which about thirty occur between the sutures upon the last two volutions. In addition to these axial ribs, the whorls are marked by low, feebly rounded, rather broad, spiral cords, of which six occur between the sutures on the second, and seven upon the third and fourth whorls; the spaces separating the spiral cords are narrow, impressed lines. The intersections of the axial ribs and spiral cords from weak tubercles, while the spaces inclosed between them are roundish pits. Sutures moderately constricted. Periphery of the last whorl well-rounded, marked by a cord equaling the one posterior to it in width, and separated from that by a line as wide as those on the spire. Base moderately prolonged, well-rounded, marked with twelve, low, rounded spiral cords, which decrease successively in width from the periphery, anteriorly; the spaces separating these cords are also narrow impressed lines. Aperture moderately large, oval; posterior angle acute; outer lip strongly curved, showing the external sculpture within; inner lip slightly curved, oblique, reflected over and adnate to the base, provided with a slender fold at its insertion. Parietal wall covered by a thin callus. Length, 2; diameter, 1 mm. (Bartsch.)

Type in United States National Museum, No. 249903. Type locality, Coronado Island, San Diego.

Range. Known only from type locality.

Odostomia trachis Dall and Bartsch, 1909

Plate 58, figs. 4, 4*a*

Bulletin 68, United States National Museum, 148; Pl. 15, figs. 4, 4*a*.

Shell small, elongate-conic. Nuclear whorls small, smooth, strongly obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, strongly contracted at the sutures, slopingly shouldered at the summit, marked by strong, rounded, decidedly retractive axial ribs, of which sixteen occur upon the second, eighteen upon the third, and twenty upon the penultimate turn. In addition to the axial ribs the whorls are crossed between the sutures by four spiral cords which are as strong as the ribs and render them nodulous at the junction. The second of these cords below the summit marks the angle of the shoulder. The spaces inclosed by the ribs and cords are deep, squarish pits. Sutures subchanneled. Periphery of the last whorl marked by a groove, crossed by the spiral ribs, which terminate at the extremity of the first basal cord. Base well-rounded, marked by four subequal, distantly spaced, narrow, spiral cords, the broad spaces between which are crossed by numerous axial threads. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, reflected, re-enforced by the base, provided with a fold at its insertion; parietal wall covered with a thin callus. Length, 2.5; diameter, 1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 168619. Type locality, San Pedro, California.

Range. Monterey to San Diego, California.

Odostomia vicola Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 153; Pl. 16, fig. 11.

Shell ovate, vitreous. Nuclear whorls large, deeply immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects, which is marked by five slender spiral threads. Post-nuclear whorls rounded on all but the first whorl, marked by very broad, strong, retractive axial ribs, of which sixteen occur upon the second and third and twenty upon the penultimate turn. In addition to the axial ribs the whorls are marked by four, very broad, low, spiral cords, which are separated by mere incised lines between the sutures, which render their junction with the axial ribs very strongly nodulous. Sutures constricted, showing a portion of the peripheral cord. Periphery of the last whorl marked by a strong, well-rounded, spiral cord. Base of the last whorl decidedly attenuated, marked by seven subequal spiral cords, the spaces between which are marked by numerous, slender, axial threads. Aperture elongate-ovate, decidedly effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within, rendered sinuous by the spiral cords; columella long, moderately strong, somewhat sinuous, reflected, re-enforced by the base, and provided with a fold at its insertion. Length, 2.5; diameter, 1.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206899. Type locality, San Pedro Bay, California.

RANGE. Known only from type locality.

Odostomia vincta Dall and Bartsch, 1909

Plate 59, fig. 4

Bulletin 68, United States National Museum, 165; Pl. 17, fig. 4.

Shell elongate-ovate, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls flattened, strongly contracted at the periphery, well-shouldered at the summit, marked by strong, somewhat retractive, axial ribs, which terminate at the posterior edge of the first supraperipheral keel, which is smooth. Of these ribs, eighteen occur upon the second, twenty upon the third, twenty-two upon the fourth, and twenty-seven upon the penultimate turn. In addition to the axial ribs the whorls are marked by four spiral keels, which equal the ribs in strength and render their junction nodulous. The spaces inclosed by the axial ribs and spiral cords are well-impressed round pits. Sutures strongly channeled. Periphery of the last whorl marked by a strong groove. Base of the last whorl well-rounded, marked by five spiral cords, which grow successively a little weaker from the periphery to the umbilical area. The spaces between these cords are marked by slender spiral threads which correspond to the ribs on the spire. Aperture oval, posterior angle obtuse; outer lip thin, rendered wavy by the spiral cords; columella moderately strong, decidedly curved, reflected, and re-enforced by the base, provided with a slender fold at its insertion. Length, 2.7; diameter, 1.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162762. Type locality, San Pedro, California.

Range. Known only from type locality.

Odostomia virginalis Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 160; Pl. 18, figs. 7, 7*a*.

Shell elongate-conic, thin, semitranslucent. Nuclear whorls obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which is marked by three, strongly elevated, spiral threads. Post-nuclear whorls well-rounded, moderately contracted at the sutures and strongly slopingly shouldered, marked, weak, rounded axial ribs, which are best developed near the edges of the shoulder. Of these ribs about twenty-four are indicated on the first turn, eighteen upon the second to fourth, and twenty upon the penultimate turn. In addition to the axial sculpture the whorls are marked between the sutures by a number of spiral keels of diverse strength, of which four occur upon the first and second, five upon the third, six upon the fourth and the penultimate whorl. Of these spiral ridges the second one below the summit is the strongest and marks the angle of the shoulder. The junction of the ribs and the cords form feeble nodules best shown at the shoulder. Sutures strongly constricted. Periphery of the last whorl marked by a low cord. Base well-rounded, marked by four, low, broad cords and seven exceedingly fine incised lines, the latter about the umbilical area. The narrow, strongly incised grooves which separate the cords are crossed by numerous fine axial threads, which give them a pitted appearance. Aperture oval, slightly effuse anteriorly; posterior angle acute; outer lip rendered slightly wavy by the external cords, thin, showing the external sculpture within; columella slender, curved, provided with a deep-seated fold at its insertion. Length, 3; diameter, 1.1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 46152. Type locality, Todos Santos Bay, Lower California.

Range. San Pedro, California, to Point Abreojos, Lower California.

Equals *Evalea gracilienta* (Carpenter) Keep, 1888, not *Odostomia gracilienta* Monterosoto, 1884.

Subgenus IVIDELLA Dall and Bartsch, 1909

Odostomia navisa Dall and Bartsch, 1907

Plate 57, fig. 2

Proceedings of the United States National Museum, 33:517; Pl. 46, figs. 2, 2*a*.

Shell of medium size, strongly sculptured, subdiaphanous to milk-white. Nuclear whorls at least 2, obliquely a little more than half immersed. Post-nuclear whorls strongly shouldered, subtabulated, with a strong, broad, spiral keel limiting the anterior edge of the shoulder and an acute raised keel on the middle of the whorls between the sutures, while a third equally acute keel marks the periphery of the last whorl. Two other keels ornament the base, the anterior one of which is not quite as strong as its neighbor. The axial sculpture consists of narrow, more or less lamellar, almost vertical ribs, which render the intersection with the spiral keels somewhat thickened but not nodulose. These axial ribs extend over the periphery and base of the last whorl to the umbilical region, gradually growing weaker as they approach this point. There are about eighteen on the second and twenty upon the penultimate whorl. The spaces between the ribs and keels appear as concave quadrangular depressions. Umbilicus narrowly perforated. Suture deeply channeled by the shouldered whorl. Aperture suboval, posterior angle decidedly obtuse; outer lip thick, marked by five projections, corresponding to the five keels; columella almost straight, strongly revolute with a conspicuous oblique fold near its insertion; parietal wall covered by a faint callus showing both basal keels, the anterior faint and just posterior to the insertion of the columella and the next on the middle of the wall. Length, 2.7; diameter, 1.3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 106502. Type locality, Scammons Lagoon, Lower California.

RANGE. San Pedro, California, to Scammons Lagoon, Lower California.

Odostomia navisa delmontensis Dall and Bartsch, 1907

Plate 57, figs. 3, 3*a*

Proceedings of the United States National Museum, 33:518; Pl. 46, figs. 3, 3*a*.

Shell similar to *O. navisa* but more elongate, and in every way more delicate, with lamellose sculpture reduced almost to raised cords and with stronger shouldered summits and more open umbilicus. Length, 3.2; diameter, 1.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 196297. Type locality, off Del Monte, Monterey Bay, California, in 12 fathoms.

Range. Known only from type locality.

Odostomia pedroana Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 172; Pl. 19, figs. 8, 8*a*.

Shell large, robust, chocolate-brown. Nuclear whorls two, moderately large, forming a helicoid spire whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls very strongly sculptured, with three spiral keels between the sutures, one of which at the summit is slender, the other two are strong and equal, the supraperipheral one being about as far posterior to the suture as the one at the summit is from its neighbor. In addition to the spiral keels the whorls are marked by narrow retractive axial ribs, of which fourteen occur upon the first, sixteen upon the second to third, eighteen upon the fourth, twenty upon the fifth and sixth, and twenty-four upon the penultimate turn. The junctions of the axial ribs and spiral keels are somewhat tuberculated, while the spaces inclosed between them are deeply impressed pits. A strong keel marks the periphery of the last whorl and another equally strong occupies the middle of the base, the space between them being a concave channel, which, like the one posterior to the peripheral keel is crossed by the axial ribs. The axial ribs become much enfeebled as they pass over the basal keel and are almost obsolete on the spaces anterior to it. Aperture irregularly oval; posterior angle obtuse; outer lip thin, rendered angular by the spiral keels; columella very strong, almost straight, slightly reflected; parietal wall covered by a thin callus. Length, 6.7; diameter, 2.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 107422. Type locality, San Pedro, California.

Range. San Pedro, California, to Scammons Lagoon, Lower California.

Subgenus Miralda A. Adams, 1864

Odostomia aepynota Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 178; Pl. 19, fig. 5.

Shell pupiform, translucent. Nuclear whorls small, obliquely immersed in the first post-nuclear turns, marked by four spiral cords. Post-nuclear whorls with the summits appressed, marked by two strong, spiral keels between the sutures, a third at the periphery, and a fourth on the middle of the base, the last two somewhat less strong than the rest. The posterior keel forms the strong tabulation at the summit of the whorls and is strongly tuberculated, fourteen tubercles appearing upon the second and twenty upon the remaining whorls. The space between the keels is marked by rather strong lines of growth. The greatest convexity coincides with the superperipheral keel. Aperture irregularly ovate, somewhat effuse anteriorly; posterior angle obtuse; outer lip angulated by the keels, thin, showing the external markings within; columella strong, curved, without visible fold in the aperture; re-enforced by the base; parietal wall covered by a thin callus. Length, 1.9; diameter, 0.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 129335. Type locality, San Pedro, California.

Range. San Pedro, California, to Cape San Lucas, Lower California.

Odostomia hemphilli Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 176; Pl. 19, fig. 10.

Shell broadly conic, milk-white. Nuclear whorls deeply obliquely immersed, apparently smooth. Post-nuclear whorls well-rounded, marked with three, strong, equal spiral keels, the posterior two of which are tuberculate, the third one smooth. The tubercles are connected axially by slender riblets, which extend to the third keel. There are about twenty tubercles on the latter whorls, while on the early whorls they are ill-defined. Sutures deeply channeled. Periphery of the last whorl marked by a smooth spiral keel, equal to the one posterior to it. Base moderately long, well-rounded, marked by four spiral keels, which grow successively weaker anteriorly. Aperture irregularly ovate; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella stout, provided with a strong fold at its insertion. Length, 3.5; diameter, 1.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 162841. Type locality, San Hipolito Point, Lower California.

Range. San Pedro, California, to Point Abreojos, Lower California.

Subgenus IVARA Dall and Bartsch, 1903

Odostomia terricula Dall and Bartsch, 1903

Memoirs of the California Academy of Sciences, 3: 285; Pl. 4, fig. 14, 1903.

Shell very elongate-ovate, milk-white. Nuclear whorls smooth, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, very broadly tabulately shouldered at the summit, moderately contracted at the periphery, marked by low, feebly developed axial ribs, which are best shown at the angle of the shoulder and scarcely extend to the suture. In addition to the axial ribs, the whorls are marked by well-incised spiral lines, of which seven occur between the sutures on the second and nine upon the third and the penultimate turn. Periphery and base of the last whorl well-rounded, the latter somewhat produced, marked by the very feeble continuation of the axial ribs and eight spiral lines. Aperture ovate, posterior angle squarely truncated; outer lip thin; columella strongly curved and reflected over the re-enforcing base; provided with a strong fold at its insertion. Length of type, 4; diameter, 1.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 168716. Type locality, San Pedro, California.

Range. Monterey, California, to Point Abreojos, Lower California. Fossil: Pleistocene, San Pedro, California.

Subgenus Evalina Dall and Bartsch, 1904

Odostomia americana Dall and Bartsch, 1904

Proceedings of the Biological Society of Washington, **17**:16.

Shell elongate-conic, subdiaphanous to milk-white. Nuclear whorls quite large, at least two, about three-fourths obliquely immersed. Postnuclear whorls rather broad between the sutures, well-rounded, faintly shouldered at the summit, ornamented with depressed, rounded, rather broad, axial ribs, about eighteen of which occur upon the second, twenty on the third, and eighteen upon the penultimate whorl. The ribs are best developed near the summits of the whorls and scarcely extend to the periphery. Spiral lirations low, rounded, subequal; about twelve occur between the sutures upon the third and penultimate whorls. These spiral lirations like the axial ribs appear strongest near the summits of the whorls. Periphery and base of the last whorl well-rounded, the latter ornamented by about eleven lirations which are similar in character to those between the sutures but much less strongly expressed. Aperture rather broad, suboval, somewhat effuse anteriorly, posterior angle acute; outer lip thin; columella short, somewhat curved, strongly revolute anteriorly, having a weak, oblique fold near its insertion. Long., 2.9; diam., 1.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 168718. Type locality, San Pedro, California.

Range. San Pedro, California, to Coronado Islands.

Subgenus Iolaea A. Adams, 1867

Odostomia amianta Dall and Bartsch, 1907

Plate 57, figs. 9, *9a*

Proceedings of the United States National Museum, 33:519; Pl. 46, fig. 9.

Shell broadly conic, yellowish-white. Nucleus small, of two whorls, which increase extremely rapidly in size and are obliquely placed. Post-nuclear whorls very strongly shouldered, marked by three, very strong, lamellar, spiral keels on the first and second, and four on the succeeding whorls between the sutures. The posterior keel marks the limit of the broad, sloping shoulder and is much the strongest. It is also placed a little farther apart from the next spiral keel than that is from its neighbor. Base of the last whorl well-rounded; ornamented by eight spiral ridges, which are less elevated and much more closely and regularly spaced than those between the sutures. The peripheral groove is about equal in width to the one anterior to the posterior keel. The entire shell is marked by fine, sublamellar, regularly spaced, retractive, axial ribs, which render the spiral keels somewhat crenulated at their meeting points and break the spaces between them into small squares or oblongs. These riblets extend from the sutures to the small umbilicus. Aperture subovate, posterior angle obtuse; outer lip thin, somewhat wavy, showing the external sculpture within; columella moderately stout, somewhat curved, and strongly revolute, having an oblique fold near its insertion which is barely visible when the aperture is viewed squarely; parietal wall covered by a fairly thick callus. Length, 4.4; diameter, 2.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 105483. Type locality, Point Abreojos, Lower California.

Range. Monterey Bay, California, to Point Abreojos, Lower California.

Odostomia eucosmia Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 183; Pl. 20, fig. 10.

Shell elongate-conic, subdiaphanous to milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last one projects. Post-nuclear whorls somewhat contracted at the periphery, very strongly slopingly shouldered at the summit, marked by three strong lamellar keels between the sutures, of which the middle one is a little nearer to its anterior neighbor than to the posterior, the latter being about as far from the summit as it is from the median keel. The deep channels between the keels and the shoulders are crossed by slender axial riblets which have a protractive slant on the shoulder and are decidedly retractive in the channels. Periphery of the last whorl marked by a keel a little weaker than those between the sutures. Base short, well-rounded, narrowly umbilicated, marked by three spiral cords and a slender, raised thread about the umbilicus, the channels bounding the peripheral cord and those of the base are crossed by riblets as on the spire. Aperture large; posterior angle obtuse; outer lip rendered angulated by the keels, thus showing the external sculpture within; columella slender, very strongly curved, slightly reflected, provided with a weak fold at its insertion; parietal wall covered with a weak callus. Length, 2.5; diameter, 1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 106501. Type locality, Point Abreojos, Lower California.

Range. San Pedro, California, to Point Abreojos, Lower California.

Subgenus MENESTHO Moller, 1842

Odostomia amilda Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 187; Pl. 21, fig. 4.

Shell ovate, transparent. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last whorl projects. Post-nuclear whorls well-rounded, slightly contracted at the sutures, and somewhat shouldered at the summits, the first marked by four, slender, equal and subequally spaced, incised, spiral lines; the rest are marked by a strongly incised groove a little below the summit, which causes this to appear bounded by a well-rounded cord; the remainder of the whorls between the sutures show a few distantly spaced and feebly incised, spiral lines and numerous very fine, decidedly retractive lines of growth. Periphery of the last whorl well-rounded. Base somewhat inflated, well-rounded, slightly attenuated anteriorly, marked by numerous exceedingly fine, microscopic spiral striations and three, well-incised, equal and equally spaced lines on the anterior half. Aperture oval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, decidedly curved, somewhat reflected, re-enforced by the base; provided with a strong fold at its insertion. Length, 2.6; diameter, 1.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206907. Type locality, Round Island, Lower California.

Range. San Diego, California, to Round Island, Lower California.

Odostomia enora Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 189; Pl. 21, fig. 2.

Shell elongate-ovate, milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, slightly contracted at the sutures and weakly shouldered at the summits, marked between the sutures by four, feebly incised, spiral grooves, of which the second one above the periphery is the weakest. Periphery of the last whorl somewhat inflated. Base well-rounded, posteriorly, somewhat attenuated anteriorly, marked by four, subequal but unequally spaced, incised lines. Aperture oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin, columella slender, slightly curved and somewhat revolute, provided with a weak fold at its insertion. Length, 2.8; diameter, 1.3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 207126. Type locality, San Pedro, California.

RANGE. Known only from type locality.

Odostomia exara Dall and Bartsch, 1907

Plate 57, fig. 6

Proceedings of the United States National Museum, 33:521; Pl. 46, fig. 6.

Shell elongate-ovate, subdiaphanous. Nuclear whorls smooth, deeply immersed in the first of the succeeding turns, only a part of the last one appearing above it. Post-nuclear whorls somewhat inflated, well-rounded, marked on the first whorl by eight, on the second by twelve, on the third by fourteen, and on the penultimate between the sutures by twenty, subequal and equally spaced, low, depressed spiral cords which are separated by narrower channels. Periphery and base of the last whorl inflated, sculptured like the spire by probably twenty spiral cords. In addition to the spiral sculpture the entire surface is marked by fine incremental lines, which are best marked in the spaces between the cords. Aperture oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella decidedly curved, re-enforced by the attenuated base, free only at its anterior extremity, where it is somewhat revolute, provided with a prominent fold at its insertion, which appears as the thickened inflection of the columella; parietal wall covered by a thin callus. Length, 3.9; diameter, 2.1 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196250. Type locality, Pacific Grove, California.

RANGE. Known only from type locality.

Odostomia excisa Bartsch, 1912

Proceedings of the United States National Museum, **42**:276; Pl. 36, fig. 8.

Shell moderately large, elongate-ovate, yellowish-white. Nuclear whorls decollated. Post-nuclear whorls well-rounded, appressed at the summit, marked by four, equally strong but not equally spaced, incised, spiral lines between the sutures. The fourth of these is immediately above the periphery, while the first is as far below the summit as the third is posterior to the fourth. The second line divides the space between the first and third into equal halves, which are about one and a half times as wide as the spaces included between the third and fourth incised spirals. In addition to the spiral sculpture the whorls are crossed by numerous, fine, decidedly retractive, incremental lines. Periphery of the last whorl somewhat inflated, well-rounded. Base moderately long and moderately rounded, crossed by 8 strongly incised, equal, spiral lines, which are a little stronger than those occurring on the spire. These lines become exceedingly closely spaced between the periphery and the umbilical area. The axial sculpture on the base is of the same character and strength as that appearing on the spire. All of the incised, spiral lines on the base and spire are crossed by very slender, axial threads, which lend these channels a somewhat pitted appearance. Sutures well-impressed. Aperture moderately large, oval, effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip oblique, moderately long, somewhat reflected, and re-enforced for the greater part of its length by the attenuated base, provided with an oblique fold at its insertion; parietal wall glazed with a thin callus. Length, 3.9; diameter, 1.9 mm. (Bartsch.)

Type in United States National Museum, No. 194518. Type locality, Catalina Island, California.

Range. Known only from type locality.

Odostomia farma Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 188; Pl. 20, figs. 1, 1*a*.

Shell elongate, ovate, cream-colored. Nuclear whorls at least two, marked with three slender, spiral lirations, the apex being deeply obliquely immersed in the first of the succeeding turns. The junction of the nucleus and the post-nuclear whorls is marked by a varix. Post-nuclear whorls well-rounded, marked by three, equal and subequally spaced, spiral grooves which are crossed by slender axial riblets, the combination of grooves and ribs giving the whorls a pitted appearance. The four raised spaces bounded by the spiral grooves are finely spirally striated. Suture deeply channeled. Periphery of the last whorl marked by a spiral groove. Base of the last whorl well-rounded, marked by four incised lines on the posterior two-thirds, which are equally spaced but grow successively weaker. The peripheral and first subperipheral channel are equal to those on the spire; all are rendered pitted by the slender axial riblets. Anterior third smooth. Aperture broadly oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella slender, curved, somewhat reflected and re-enforced by the base; parietal wall covered by a thin callus. Length, 2.4; diameter, 1.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206908. Type locality, Catalina Island, California.

Range. Known only from type locality.

Odostomia fetella Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 189; Pl. 21, figs. 9, 9*a.*

Shell very elongate, milk-white. Nuclear whorls small, obliquely two-thirds immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, moderately contracted at the sutures and slightly shouldered at the summit, marked by four, strong, flattened cords, which grow successively a little weaker from the summit to the periphery, separated by narrow, deeply incised spiral grooves. Periphery of the last whorl marked by a broad, flat cord somewhat wider than the first supra-peripheral one. Base of the last whorl somewhat attenuated anteriorly, well-rounded, marked by eleven, equal and equally narrow, rounded, spiral cords. In addition to this sculpture, there are many very fine incised spiral lines and decidedly retractive axial lines of growth on the spire and base. Aperture broadly oval, slightly effuse anteriorly, posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, slightly curved, somewhat reflected, completely re-enforced by the base, provided with a strong fold at its insertion; parietal wall covered by a thin callus. Length, 4.4; diameter, 1.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 46478. Type locality, San Diego, California.

Range. San Pedro, California, to San Ignacio Lagoon, Lower California.

Odostomia gloriosa Bartsch, 1912

Proceedings of the United States National Museum, 42:276; Pl. 36, figs. 2, 2*a.*

Shell moderately large, very elongate-ovate, with very regular, conic spire, bluish-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which a portion of the last two volutions only project. Post-nuclear whorls flattened, marked by three equal and equally spaced, strong, spiral keels, of which one is at the summit and another about as far above the periphery as the space which separates it from the median keel. The spaces between the spiral keels are deep, rounded grooves, almost as wide as the keels and crossed by numerous, slender, axial threads. Sutures deeply channeled; channels a little more profound than those between the keels. Periphery of the last whorl marked by a sulcus. Base short, well-rounded, and marked by four, subequal and subequally spaced, spiral cords, the spaces between which appear as rather broad sulci and are crossed by slender axial threads. Aperture small, very oblique, ovate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip short, curved, slightly revolute, provided with a strong fold at its insertion; parietal wall glazed with a thin callus. Length, 3.1; diameter, 1.4 mm. (Bartsch.)

TYPE in United States National Museum, No. 211561. Type locality, San Diego, California.

RANGE. San Diego, California, to San Hipolito Point, Lower California.

Odostomia harfordensis Dall and Bartsch, 1907

Plate 57, fig. 5

Proceedings of the United States National Museum, 33:521; Pl. 46, fig. 5.

Shell elongate-ovate, bluish-white. Nuclear whorls smooth, obliquely immersed in the first of the succeeding turns, only two-thirds of the last volution projects above them. Post-nuclear whorls well-rounded, and somewhat inflated, marked by numerous incremental lines and 5, equally strong, but irregularly distributed, punctate, incised, spiral lines between the sutures. The two near the summit are placed closer to each other than any of the others, the space between the summits and in the second line being about equal to the space inclosed between the first and second supraperipheral lines. The third line falls on about the middle of the exposed portion of the whorls and is a little nearer to the second line than the one anterior to it. In addition to these 5 strongly incised lines there are numerous very fine and closely spaced spiral striae which cross all parts of the surface of the shell. Periphery and base of the last turn inflated, the latter marked by lines of growth and 8 strongly incised, punctate spiral lines, which are a little less strongly impressed and a little more closely spaced at the umbilical area than at the peripheral part of the base. These lines equal those of the spire in strength. Sutures constricted. Aperture very large, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella curved; re-enforced by the attentuated base and provided with a strong fold and its insertion; parietal wall covered by a thin callus. Length, 3.2; diameter, 1.8 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196299. Type locality, Port Harford, California.

RANGE. Known only from type locality.

Odostomia hypocurta Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 190; Pl. 21, fig. 8.

Shell very elongate-ovate, bluish-white. (Nuclear whorls decollated.) Post-nuclear whorls well-rounded, marked by five, broad, strong, deeply incised, spiral grooves, that divide the space between the sutures into raised, flattened keels, which are successively a little wider from the summit to the periphery. Periphery of the last whorl marked by a groove similar to those above. Base rather short, moderately rounded, marked by five subequal and subequally spaced, spiral grooves, which are a little weaker than those on the spire. The entire surface of the shell is marked by slender lines of growth, and the raised spaces between the spiral grooves are finely spirally striated. Suture strongly impressed. Aperture? (outer lip fractured); columella strong, curved, revolute, its posterior two-thirds re-enforced by the base; columella fold not visible in the aperture. Operculum paucispiral. Length, 4.3; diameter, 2.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum; No. 168660. Type locality, United States Bureau of Fisheries Station 3306, off Bristol Bay, Bering Sea, Alaska.

RANGE. Known only from type locality.

Odostomia pharcida Dall and Bartsch, 1907

Plate 57, fig. 8

Proceedings of the United States National Museum, 33:520; Pl. 46, fig. 8.

Shell small, subcylindric, yellowish-white. Nuclear whorls deeply immersed, a portion of the last and the penultimate only appear when viewed from the side; this gives the shell a truncated appearance. Post-nuclear whorls moderately well-rounded, rather wide between the sutures, and somewhat shouldered at the summits; ornamented by strong, low, rounded spiral cords, which are separated by moderately deep, narrow, depressed channels. Six of these cords occur upon the first, 7 upon the second to the penultimate whorl, between the sutures; the posterior cord is a little broader and less elevated than the rest, while some of those on the penultimate turn show a tendency to divide, that is, a faint spiral line is apparent on the middle of some of these cords. Sutures well-impressed. Periphery and base of the last whorl well-rounded, the latter ornamented by 8 rounded spiral cords similar to those between the sutures. The spaces between the spiral ridges on the base and between the sutures are marked by closely placed, exceedingly slender, raised, axial threads. Aperture pyriform, somewhat effuse anteriorly, posterior angle acute; columella short, curved, re-enforced by the attenuated base, free only at its extreme anterior end, with an oblique fold near its insertion; parietal wall covered by a thin callus. Length, 2.2; diameter, 0.9 mm. (Dall and Bartsch.)

Type in United States National Museum; No. 107440. Type locality, Cumshewa Inlet, Queen Charlotte Islands, British Columbia.

Range. Known only from type locality.

Subgenus Evalea A. Adams, 1860

Odostomia aleutica Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 196; Pl. 22, fig. 5.

Shell broadly conic, light green. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls somewhat inflately rounded, with well-rounded summits. Entire surface marked by fine lines of growth and numerous very fine, closely spaced, wavy, spiral striations. Sutures strongly impressed. Periphery of the last whorl and base well-rounded, the latter quite strongly inflated. Aperture broadly ovate, somewhat effuse anteriorly, posterior angle acute; outer lip broadly curved, thin; columella slender, curved, and reflected, free from the base, forming a suggestion of an umbilicus; columella fold slender, situated a little below the insertion of the columella; parietal wall covered by a thin callus. Length, 4.4; diameter, 2.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 205179. Type locality, Station 3336, in Iliuliuk Harbor, Bering Sea, Alaska.

Range. Captain's Harbor, Unalaska, Alaska, to Amaknak Island, Unalaska, Alaska.

Odostomia altina Dall and Bartsch, 1909

Plate 60, fig. 2

Bulletin 68, United States National Museum, 214; Pl. 25, fig. 2.

Shell ovate, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, feebly contracted at the suture, appressed at the summit. Suture slightly impressed. Periphery obscurely angulated. Base well-rounded. Entire surface marked by slightly retractive lines of growth and exceedingly fine spiral striations. Aperture ovate, posterior angle acute; outer lip thin; columella strongly curved, decidedly revolute, provided with a strong fold at its insertion. Length, 3; diameter, 1.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206923. Type locality, United States Bureau of Fisheries Station 2936, in 359 fathoms, off San Diego, California.

Range. Known only from type locality.

Odostomia amchitkana Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 210; Pl. 24, fig. 7.

Shell broadly conic, thin, semitranslucent, bluish-white. Nuclear whorls very obliquely immersed in the first of the succeeding turns, above which only the last half of the last turn is visible. Post-nuclear whorls well-rounded, faintly shouldered at the summit, marked by fine lines of growth and numerous, very fine, equal and equally spaced, spirally incised lines, of which there are probably more than forty between the periphery and the summit of the last turn. Sutures rendered subchanneled by the slight shoulder at the summit of the whorls. Periphery and base of the last whorl well-rounded, the latter somewhat attenuated and marked like the spaces between the sutures. Aperture large, broadly pear-shaped, posterior angle obtuse; outer lip broadly recurved, thin, showing the fine external striation within; columella slender, curved, and revolute; re-enforced by the attenuated base and provided with a weak fold at its insertion, which is not visible when the aperture is viewed squarely; parietal wall glazed with a thin callus. Length, 3.3; diameter, 1.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 161088. Type locality, Constantine Harbor, Amchitka Island, Alaska.

Range. Amchitka Island, Aleutian, to Peril Strait, Alaska.

Odostomia angularis Dall and Bartsch, 1907

Plate 66, fig. 2

Proceedings of the United States National Museum, **33**:523; Pl. 47, fig. 2.

Shell very regularly elongate-conic, subdiaphanous to milk-white. Nuclear whorls small, deeply obliquely, immersed in the first of the succeeding turns, above which the tilted edge of the last turn only is visible. Post-nuclear whorls slightly rounded, separated by constricted sutures, marked by numerous, slender, wavy, subequal and subequally closely spaced, spiral striations, of which about 33 occur upon the last turn between the summit and the periphery. Periphery of the last whorl marked by a slender raised keel, decidedly angulated. Base short, moderately rounded, narrowly attenuated anteriorly to re-enforce the columella, sculptured like the posterior portion of the whorls. Aperture ovate, very broad, slightly effuse anteriorly; posterior angle acute; columella very slender, evenly curved, closely appressed to the attenuated base, with a strong fold at its insertion which is barely visible when the aperture is viewed squarely. Length, 5.6; diameter, 2.8 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 150565. Type locality, Nanaimo, British Columbia.

RANGE. Sitka, Alaska, to Port Harford, California.

Odostomia atossa Dall, 1908

Proceedings of the United States National Museum, **34**:253; **52**; Pl. 26, fig. 8, 1909.

Shell small, bulimiform, bluish-white, polished, with four gently convex whorls beside a very minute (and somewhat eroded) nucleus of about one whorl; suture distinct, not appressed; surface with two or three faint spiral threads on the second, four or more on the third, becoming obsolete on the last, subequally distributed between the sutures; besides these there are numerous extremely fine spiral striae only visible under a lens, and which become obsolete toward the aperture; aperture subovate, acute behind; outer lip simple, sharp; anterior margin gently rounding into the arcuate pillar lip, which has a single plait close to the body; a thin wash of transparent enamel on the body; axis imperforate; operculum thin. Height of shell 6.25; of last whorl, 5.0; of aperture, 3.25; maximum diameter, 3.7 mm. (Dall.)

TYPE in United States National Museum, No. 110637. Type locality, San Pedro, California.

RANGE. Known only from type locality.

Odostomia baldridgae Bartsch, 1912

Proceedings of the United States National Museum, **42**:284; Pl. 38, figs. 1, 1*a*.

Shell very elongate-conic, yellowish-white. Nuclear whorls small, immersed in the first of the succeeding turns, above which only half of the last volution projects. Post-nuclear whorls high between the sutures, appressed at the summit, slightly rounded, marked by feeble lines of growth, and many subequal and subequally spaced, strongly incised, spiral lines. About 25 of these occur between the sutures of the fourth whorl and about 30 between the summit and the periphery of the penultimate turn. Sutures strongly impressed. Periphery of the last whorl somewhat angulated. Base well-rounded, moderately long, marked like the spire. Aperture elongate-oval, slightly effuse anteriorly; posterior angle acute; outer lip decidedly sinuous, bent back at the posterior angle to almost form a notch, thin; inner lip moderately long, oblique, slightly curved and slightly revolute, provided with a strong fold at its insertion; parietal wall glazed with a thin callus. Length, 5.6; diameter, 2 mm. (Bartsch.)

Type in United States National Museum, No. 211558. Type locality, San Pedro, California.

Range. Known only from type locality.

Odostomia baranoffensis Dall and Bartsch, 1909

Plate 60, fig. 3

Bulletin 68, United States National Museum, 215; Pl. 25, fig. 3.

Shell elongate-ovate, rather stout, yellowish-white. Nuclear whorls obliquely immersed in the first of the succeeding turns, the outer edge of the last turn only being visible. Post-nuclear whorls well-rounded, with a narrow, tabulate shoulder at the summit. Suture rendered subchanneled, by the shoulder at the summit of the whorls. Periphery and base of the last whorl inflated, well-rounded, the latter with a depressed pit, but no perforation in the umbilical area. Entire surface marked by lines of growth and very fine spiral striations. Aperture ear-shaped; posterior angle obtuse; outer lip thick within, thin at the edge; columella very stout, twisted and obliquely revolute, armed with a thick oblique fold opposite the umbilical chink; parietal wall covered by a thin callus. Length, 6.3; diameter, 2.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 204011. Type locality, Bear Bay, Peril Straits, Baranoff Island, Alaska.

Range. Baranoff and Admiralty Islands, Alaska.

Odostomia barkleyensis Dall and Bartsch, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N,* 19; Pl. 2, fig. 8.

Shell small, regularly conic, bluish-white. Nuclear whorls deeply, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls slightly rounded, marked by fine retractive lines of growth and numerous fine, spiral striations. Sutures strongly impressed. Periphery of the last whorl subangulated. Base rather short, sloping from the subangulated periphery to its anterior margin, with a tumid area bounding the narrow umbilicus, marked like the spire. Aperture oval; posterior angle acute; outer lip thin; columella decidedly curved and reflected, provided with a strong oblique fold at its insertion; parietal wall glazed with a moderately thick callus. Length, 3.1; diameter, 1.4 mm. (Dall and Bartsch.)

Type in Geological Survey Museum, Ottawa; specimens in United States National Museum, No. 211543. Type locality, Barkley Sound, Vancouver Island, British Columbia.

Odostomia calcarella Bartsch, 1912

Proceedings of the United States National Museum, 42:279; Pl. 37, fig. 4.

Shell very broadly elongate-conic, creamy-white. Nuclear whorls obliquely immersed in the first of the succeeding turns. Post-nuclear whorls moderately well-rounded, slightly shouldered at the summit, marked by decidedly retractive lines of growth and numerous, strong, incised, spiral lines. Suture constricted. Periphery of the last whorl subangulated and inflated. Base short, narrowly umbilicated, marked like the spire. Aperture large, somewhat effuse anteriorly; outer lip thin, strongly curved and reflected, provided with a moderately strong fold a little anterior to its insertion. Length, 3.3; diameter, 1.8 mm. (Bartsch.)

Type in United States National Museum, No. 211587. Type locality, United States Bureau of Fisheries Station 2901, in 48 fathoms, off Santa Rosa Island, California.

Range. Known only from type locality.

Odostomia californica Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 208; Pl. 24, fig. 2.

Shell small, broadly conic, bluish-white. Nuclear whorls deeply very obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, the whole giving the spire a decidedly truncated effect. Post-nuclear whorls moderately rounded, feebly contracted at the suture, appressed at the summit, through which the preceding whorl shines, which gives the summit the effect of having a double suture. Suture moderately impressed. Periphery of the last whorl inflated, weakly angulated. Base short, sloping in a gentle curve from the periphery to the umbilical area. Entire surface of spire and base marked by decidedly retractive lines of growth and numerous, well-incised, spiral striations. Aperture large, ovate; posterior angle acute; outer lip thin; columella strongly curved, slightly reflected, re-enforced by the narrow base, and provided with a strong deep-seated fold at its insertion. Length, 3; diameter, 1.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206916. Type locality, Ocean Beach, California.

Range. San Diego, California, to Coronado Islands.

Odostomia callimene Bartsch, 1912

Proceedings of the United States National Museum, **42**: 281; Pl. 38, figs. 2, *2a.*

Shell elongate-ovate, milk-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only half of the last volution projects, the projecting portion extending considerably beyond the outline of the post-nuclear spire. Post-nuclear whorls slightly rounded, somewhat constricted at the summit, marked by almost vertical lines of growth and very regular, closely spaced, wavy, spiral striations; of the latter about 25 occur between the sutures and the third whorl. Periphery of the last whorl decidedly inflated, strongly rounded; base moderately long, well-rounded, with a narrow umbilicus, marked like the spire. Sutures moderately impressed. Aperture large, slightly effuse anteriorly; posterior angle acute; outer lip very thin; inner lip quite long, decidedly flexuose and somewhat reflected, provided with a strong fold opposite the umbilical chink; parietal wall glazed with a thin callus. Length, 3.1; diameter, 1.6 mm. (Bartsch.)

Type in United States National Museum, No. 211555. Type locality, off San Pedro, California.

Range. Known only from type locality.

Odostomia calliope Bartsch, 1912

Proceedings of the United States National Museum, **42**:278; Pl. 36, figs. 10, 10*a.*

Shell elongate-ovate, turreted, narrowly umbilicated, creamy-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls rather high between the sutures, decidedly, tabulatedly shouldered at the summit, almost flattened below the shoulder, the spaces between the shoulders and the suture appearing as cylindrical elements. The whorls are marked by rather strong, incremental lines and by numerous, strong, wavy, incised, spiral striations. Periphery and the moderately long base of the last whorl well-rounded, marked like the spire. Aperture large, oval; posterior angle decidedly obtuse; outer lip thin; inner lip moderately strong, oblique, somewhat sinuous, slightly reflected, and provided with a fold some little distance anterior to its insertion; parietal wall glazed with a moderately thick callus. Length, 4.2; diameter, 2 mm. (Bartsch.)

Type in United States National Museum, No. 211557. Type locality, United States Bureau of Fisheries Station 4322, in 110 to 199 fathoms, off Point La Jolla, California.

Range. Known only from type locality.

Odostomia capitana Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 200; Pl. 26, fig. 7.

Shell elongate, oval, umbilicated, light yellow. Nuclear whorls small, deeply, very obliquely immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, with strongly rounded summits. Entire surface marked by fine lines of growth and exceedingly numerous, very fine, wavy, spiral striations. In addition to these markings the whorls are covered by eight very slender, subequally spaced, obsolete threads between the sutures and four which are considerably stronger and equally spaced on the base. Periphery and base of the last whorl well-rounded, the latter narrowly umbilicated. Aperture rather large, broadly ovate, posterior angle acute; outer lip thin; columella slender; very strongly curved and reflected, not re-enforced by the base; parietal wall covered by a thin callus. Length, 4.6; diameter, 2.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 159464b. Type locality, Captain's Harbor, Unalaska, Alaska.

Range. Captain's Harbor to Kodiak, Alaska.

Odostomia cassandra Bartsch, 1912

Plate 61, fig. 2

Proceedings of the United States National Museum, 42:285; Pl. 38, figs. 5.

Shell small, ovate, very thin, semitransparent, light yellow. Nuclear whorls deeply immersed in the first of the succeeding turns. Post-nuclear whorls very strongly tabulately shouldered at the summit, moderately rounded, marked by fine incremental lines, and numerous, exceedingly closely spaced, very fine, spiral striations. Sutures strongly constricted. Periphery of the last whorl well-rounded. Base rather long, well-rounded. Aperture very large, broadly oval; posterior angle decidedly obtuse; outer lip very thin; inner lip very slender, very oblique, somewhat sinuous, strongly curved and slightly reflected over the base but not appressed to it, provided with a weak fold some little distance anterior to its insertion. Length, 2.5; diameter, 1.3 mm. (Bartsch.)

Type, one in Geological Survey Museum, the other in United States National Museum, No. 220120. Type locality, Skidegate, Queen Charlotte Islands, British Columbia.

Range. Known only from type locality.

Odostomia clessini Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 211; Pl. 24, fig. 4.

Shell elongate-ovate, rather thick, yellowish-white. Nuclear whorls small, very obliquely immersed in the first of the succeeding turns, above which the edge of only about two-thirds of the last nuclear whorl projects. Post-nuclear turns very high between the sutures, moderately rounded, marked by lines of growth and fine, irregular and irregularly distributed, incised, spiral lines. Suture well-impressed. Periphery and base of the last whorl well-rounded, marked like the spaces between the sutures. Aperture pear-shaped, posterior angle acute; outer lip rather thick within, thin at the edge; columella short, stout, curved, reflected, re-enforced by the base and provided with a strong oblique fold at its insertion; parietal wall covered by a thin callus. Length, 6; diameter, 2.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 204014. Type locality, Bear Bay, Peril Straits, Baranoff Island, Alaska.

Range. Baranoff and Admiralty Islands, Alaska.

Odostomia columbiana Dall and Bartsch, 1907

Plate 63, fig. 1; Plate 66, fig. 9

Proceedings of the United States National Museum, 33:525; Pl. 47, fig. 9.

Shell large, elongate-conic, white. Nuclear whorls small, vitreous, planorboid, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution is visible. Post-nuclear whorls increasing regularly in size, well-rounded, very narrowly roundly shouldered at the summits, which renders the sutures well-marked. Periphery of the last whorl somewhat inflated. Base well-rounded, attenuated anteriorly to re-enforce the columella. Entire surface covered by numerous, somewhat wavy, subequal and subequally closely placed, spiral lirations, of which about 40 occur between the summit and the periphery and about an equal number on the base of the last whorl. Aperture large, decidedly patulous anteriorly; posterior angle acute; outer lip thin at the edge, very thick within; columella curved and strongly reflected, free only at its anterior extremity, provided with a strong oblique fold at its insertion. Length, 8.3; diameter, 4.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 126658. Type locality, Victoria, Vancouver Island, British Columbia.

Range. Port Rupert, British Columbia, to Puget Sound.

Odostomia cookeana Bartsch, 1912

Nautilus, 23:138; Pl. 11, fig. 7.

Shell elongate-ovate, very narrowly umbilicated, yellowish-white. Nuclear whorls very obliquely immersed in the first of the succeeding turns. Post-nuclear whorls very high between the sutures where they are very moderately rounded and marked by rather strong incremental lines and very numerous fine spiral striations. Periphery and the base of the last whorl somewhat inflated, the latter strongly rounded and marked like the spire. Aperture large, oval; posterior angle acute; outer lip thin; columella decidedly oblique, quite strongly curved in the middle and somewhat reflected, provided with an oblique fold at its insertion which is strong within and tapers to a vanishing point at the free edge of the columella; parietal wall glazed with a thin callus. Length, 3.2; diameter, 2.0 mm. (Bartsch.)

Type in United States National Museum, No. 208427. Type locality, Ellamar, Alaska.

Range. Known only from type locality.

Odostomia cypria Dall and Bartsch, 1910

Plate 61, fig. 4

Proceedings of the United States National Museum, 42:282; Pl. 37, fig. 9.

Shell of medium size, narrowly elongate-ovate, umbilicated, yellowish-white. (Nuclear whorls decollated.) Post-nuclear whorls rather high between the sutures, moderately rounded, very feebly shouldered at the summit, marked by fine lines of growth and numerous, exceedingly fine, closely spaced, spiral striations. Sutures very slightly constricted. Periphery of the last whorl very rounded. Base moderately long, well-rounded, narrowly umbilicated. Aperture broadly oval, effuse anteriorly; posterior angle obtuse; outer lip thin; inner lip very oblique, slightly curved and revolute, not appressed to the base, provided with a very deep-seated, feeble fold at its insertion; parietal wall covered with a thick callus, which renders the peritreme complete. Length, 4; diameter, 2 mm. (Dall and Bartsch.)

Type in Geological Survey, Canada. Type locality, Skidegate, Queen Charlotte Islands, British Columbia.

Range. Known only from type locality.

Odostomia deliciosa Dall and Bartsch, 1907

Plate 60, fig. 5; Plate 66, fig. 5

Proceedings of the United States National Museum, 33:525; Pl. 47, fig. 5.

Shell small, elongate-conic, translucent to milk-white. Nuclear whorls small, deeply immersed in the first of the succeeding turns, above which only a portion of the last turn is visible. Post-nuclear whorls moderately rounded, very weakly roundly shouldered at the summit, separated by a strongly marked suture; a narrow band appears about the summit showing its junction with the preceding turn. Periphery and base of the last whorl inflated and well-rounded. Entire surface of base and spire marked by very fine lines of growth and numerous microscopic wavy spiral striations. Aperture rather large, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella rather stout, strongly curved, and revolute, re-enforced by the attenuated base, and covered with a strong fold at its insertion. This fold can be seen through the transparent shell as a quite strong lamella on the pillar of the turns. Length, 4; diameter, 1.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 46492. Type locality, Monterey, California.

Range. Barkley Sound, Vancouver Island, to Monterey, California.

Odostomia donilla Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 208; Pl. 24, fig. 3.

Shell broadly conic, bluish-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, slightly contracted at the suture, appressed at the summit. Periphery of the last whorl angulated. Base slightly rounded, sloping abruptly from the periphery to the umbilical area. Suture slightly impressed. Entire surface of base and spire marked by numerous almost vertical lines of growth and many well-incised spiral striations. Aperture ovate, slightly effuse anteriorly; posterior angle acute; outer lip thin; columella strongly curved, reflected, re-enforced by the base, provided with a strong fold at its insertion. Length, 4.5; diameter, 2.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 126626. Type locality, San Pedro, California.

Range. San Pedro, California, to Todos Santos Bay, Lower California.

Odostomia edmondi E. Jordan, 1920

Proceedings of the United States National Museum, **58**:3; Pl. 1, fig. 2.

Shell small, fairly solid, conic; surface more or less eroded, the sculpture if present, no longer in evidence; nuclear whorls prominent, hardly immersed; post-nuclear whorls nearly but not quite flat; sutures not very prominent, hardly channeled; base moderately long, evenly rounded; umbilicus very minute, closed; aperture egg-shaped; peristome almost complete; columella and inner lip with considerable callus and one oblique plait. Color gray. Length, 3.1; diameter, 1.8 mm. (E. Jordan.)

Type in United States National Museum, No. 334787. Type locality, Trinidad, California.

Range. Known only from type locality.

Odostomia esilda Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 196; Pl. 22, fig. 1.

Shell elongate-ovate, light yellow. Nuclear whorls decollated. Post-nuclear whorls inflated, slightly rounded in the middle, more so toward the suture, and the appressed summit. Periphery and base of the last whorl well-rounded, the latter narrowly umbilicated. Entire surface of spire and base marked by vertical lines of growth and numerous very fine, closely spaced, spiral lirations. Aperture large, oval, slightly effuse anteriorly; posterior angle obtuse; outer lip thin; columella slender, strongly reflected, almost closing the umbilicus; provided with a strong, deep-seated fold at its insertion. Length, 5.5; diameter, 2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206909. Type locality, United States Bureau of Fisheries Station 2936, in 359 fathoms, off San Diego, California.

Range. Known only from type locality.

Odostomia franciscana Bartsch, 1917

Proceedings of the United States National Museum, **52**:665; Pl. 45, fig. 7.

Shell thin, broadly elongate-conic, yellowish-white. Nuclear whorls small, deeply embedded in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls inflated, well-rounded, feebly shouldered at the summit, marked by almost vertical, very feeble, incremental lines and exceedingly fine, closely spaced, spiral striations. Suture moderately constricted. Periphery of the last whorl very feebly angulated. Base short, inflated, well-rounded, with a very narrow umbilical chink. Aperture large; posterior angle acute; outer lip thin; inner lip strongly curved, somewhat reflected and provided with a strong, oblique fold at its insertion; parietal wall glazed with a thin callus. (Bartsch.)

Type in United States National Museum, No. 214431. Type locality, United States Bureau of Fisheries Station 5729, San Francisco Bay, California.

Range. Known only from type locality.

Odostomia gravida Gould, 1852

Plate 60, fig. 7

Boston Journal of Natural History, 6:384; Pl. 14, fig. 14.

T. ovato-conica, elevata, eburnea, polita; spira acuta; anfr. 6 supra rotundatis, ultimo subangulato, trientes duos testae adequante; apertura ovata, antice rotundata, postice acuta; labro expanso; plica columellari acuta, transversa, umbilico parvo suffossa. (Gould.)

Shell small, ovate conic, elevated, ivory-white, polished; whorls six, abruptly rounded above, rather flattened at the middle, the last whorl two-thirds the length of the shell; slightly angular at periphery; suture delicate. Aperture ovate, rounded at base; lip slightly everted, with a constriction behind it; spiral fold on the columella nearly transverse, elevated, sharp-edged, and a small umbilical opening is seen running under it. Length, one-fourth of an inch; diameter, one-tenth of an inch. (Gould.)

Type in State Museum, Albany, New York, No. 44. Type locality, Santa Barbara, California.

Range. Known only from type locality.

Odostomia hagemeisteri Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 216; Pl. 26, fig. 1.

Shell small, elongate-oval, yellowish-white. Nuclear whorls small, almost completely immersed in the first of the succeeding turns. Postnuclear whorls moderately well-rounded, with rounded summits, marked by retractive lines of growth and many, fine, closely spaced, spiral striations. Suture well-impressed. Periphery of last whorl well-rounded. Base well-rounded, marked like the spire. Aperture ovate, posterior angle acute; outer lip thick within, thin at the edge; columella very short, very strongly curved, somewhat revolute, re-enforced by the attenuated base and provided with a strong fold at its insertion. Length, 4.4; diameter, 2.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 159469. Type locality, Hagemeister Island, Bering Sea.

Range. Known only from type locality.

Odostomia herilda Dall and Bartsch, 1909

Plate 63, fig. 8

Bulletin 68, United States National Museum, 197; Pl. 23, fig. 8.

Shell elongate-conic, light yellow. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls cylindric in outline, moderately rounded in the middle and very much so at the very strongly shouldered summit. Sutures well-impressed. Periphery short, base of the last whorl well-rounded, the latter narrowly umbilicated. Entire surface of spire and base marked by numerous vertical lines of growth and exceedingly fine, closely spaced, wavy, spiral striations. Aperture ovate, posterior angle obtuse; outer lip thin; columella slender, somewhat sinuous, slightly reflected, provided with a deep-seated fold a little anterior to its insertion; parietal wall glazed with a thin callus. Length, 3.8; diameter, 1.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206910. Type locality, off San Diego, California.

Range. Known only from type locality.

Odostomia hypatia Dall and Bartsch, 1912

Plate 61, fig. 5

Proceedings of the United States National Museum, **42**:282; Pl. 37, fig. 5.

Shell large, elongate-ovate, strongly umbilicated, yellowish-white. Nuclear whorls deeply immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls well-rounded, feebly shouldered at the summit, marked by fine incremental lines, and numerous, exceedingly fine, closely spaced, spiral striations. Sutures moderately constricted. Periphery of the last whorl inflated, well-rounded. Base moderately long, well-rounded, openly umbilicated. Aperture oval, effuse anteriorly; posterior angle obtuse; outer lip thin; inner lip very oblique, slender, curved, and decidedly reflected, but not appressed to the base, provided with a moderately strong fold a little anterior to its insertion; parietal wall glazed with a thin callus. Length, 5.2; diameter, 2.8 mm. (Dall and Bartsch.)

Type in Geological Survey Museum, Canada. Type locality, Skidegate, Queen Charlotte Islands, British Columbia.

Range. Known only from type locality.

Odostomia inflata (Carpenter) Dall and Bartsch, 1907
Plate 63, fig. 7; Plate 66, fig. 8

Proceedings of the United States National Museum, **33**:524; Pl. 47, fig. 8.

Shell ovate, white. Nuclear whorls decollated. Post-nuclear whorls inflated, gently curved over the anterior two-thirds of the whorl between the sutures and more strongly so on the posterior third, this portion forming an evenly curved shoulder. Extreme summit of the whorls slightly flattened and narrow, rendering the sutures well-marked. Periphery of the last whorl subangulated. Base attenuated, rather suddenly contracted below the periphery, which gives the space between the periphery and the umbilical area a concave aspect. Entire surface marked by fine lines of growth and many, fine, closely placed, spiral lirations, five of which are a little stronger than the rest and divide the space between the sutures into subequal areas. There are about 30 of these threads upon the last turn between the summit and the periphery and about 60 on the base. Aperture very large, patulous anteriorly; outer lip thin at the edge but very thick within; columella decidedly curved, and revolute, re-enforced to the very edge by the attenuated base, provided with a strong oblique fold at its insertion. Length of the last four whorls (the others lost) 6.2; diameter, 3.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 15521b. Type locality, Neah Bay, Washington.

Range. Known only from type locality.

Odostomia io Dall and Bartsch, 1903

Memoirs of the California Academy of Sciences, **3**: 281; Pl. 1, fig. 14.

Shell regularly conic, umbilicated, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls slightly rounded, feebly contracted at the sutures, and very faintly shouldered at the summit. Sutures poorly defined. Periphery faintly angulated. Base somewhat inflated, well-rounded, narrowly umbilicated. Entire surface marked by retractive lines of growth and closely spaced spiral striations. Aperture ovate, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella slender, very strongly curved, slightly revolute, provided with a strong fold at its insertion. Length, 5.6; diameter, 2.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 56770. Type locality, Santa Rosa Island, California.

Range. Santa Rosa Island, Catalina Island, and San Pedro, California.

Odostomia jewetti Dall and Bartsch, 1907

Plate 66, fig. 3; Plate 63, fig. 3

Proceedings of the United States National Museum, 33:523; Pl. 47, fig. 3.

Shell elongate-ovate, white. Nuclear whorls very small, smooth, obliquely immersed in the first of the succeeding turns, above which only the last one is visible. Post-nuclear whorls well-rounded, a little more abruptly so on the posterior third between the sutures. Summits very narrowly flattened, which renders the sutures well-marked. Periphery of the last whorl slightly angulated. Base slightly contracted, moderately rounded between the periphery and umbilical area, narrowly produced to re-enforce the columella. Entire surface marked by numerous, somewhat wavy, subequal and subequally spaced, minute, slender, spiral lirations, of which there are about 35 between the summit and the periphery and an equal number between the periphery and the base on the last turn. Aperture large, patulous anteriorly; posterior angle acute, outer lip thin at the edge, thick within; columella curved, somewhat reflected, re-enforced by the attenuated base, and provided with a strong oblique fold at its insertion. Length, 6.1; diameter, 3.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 15521c. Type locality, Santa Barbara, California.

Range. Known only from type locality.

This is *Odostomia inflata* Carpenter, 1865, in part.

Odostomia kadiakensis Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 197; Pl. 22, fig. 9.

Shell very regularly elongate-conic, umbilicated, yellowish-white. (Nuclear whorls decollated.) Post-nuclear whorls moderately rounded, marked by vertical lines of growth and numerous, exceedingly fine, wavy, spiral striations. Sutures deeply impressed. Periphery of the last whorl well-rounded. Base strongly inflated, marked like the spire; umbilicus narrow, partly covered by the strongly reflected columella. Aperture ovate, effuse anteriorly, posterior angle acute; outer lip thin; columella thin, very oblique, strongly curved anteriorly and decidedly reflected, provided with a weak fold a little anterior to its insertion. Length, 5.2; diameter, 2.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 159470. Type locality, Kadiak Island, Alaska.

Range. Known only from type locality.

Odostomia killisnooënsis Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 195; Pl. 22, fig. 7.

Shell very elongate-ovate, umbilicated, yellowish-white. Nuclear whorls very small, obliquely, almost completely immersed in the first of the succeeding turns. Post-nuclear whorls evenly, moderately rounded, with very faintly shouldered summits, marked by numerous fairly strong, equal and equally closely spaced, wavy, spiral striations, and fine retractive lines of growth. Periphery and base of the last whorl well-rounded, marked like the spire. Suture well-impressed. Aperture ovate, somewhat effuse anteriorly, posterior angle acute; outer lip thin; columella very oblique, posterior two-thirds straight, and strongly reflected, anterior third strongly curved; columellar fold strong, oblique, situated at the insertion of the columella; parietal wall covered by a thin callus. Length, 6.4; diameter, 3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 159457. Type locality, Killisnoo, Alaska.

RANGE. Known only from type locality.

Odostomia minutissima Dall and Bartsch, 1909

Plate 60, fig. 4

Bulletin 68, United States National Museum, 211; Pl. 25, fig. 4.

Shell very small, very regularly narrowly conic, bluish-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls slightly rounded, feebly contracted at the sutures, and very narrowly tabulately shouldered at the summit. The spiral thread at the periphery and the narrow tabulated summits, which fall a little anterior to this, render the suture narrowly channeled. Periphery of the last whorl marked by a slender raised thread. Base short, well-rounded, impressed at the umbilical area. Entire surface of spire and base marked by slightly protractive lines of growth and many, very fine, closely spaced, spiral striations. Aperture rhomboidal, posterior angle obtuse; outer lip thin; columella slender, curved, slightly revolute, provided with a strong fold at its insertion. Length, 3.1; diameter, 1.3 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206918. Type locality, San Diego, California.

RANGE. San Diego, California, to Point Abreojos, Lower California.

Odostomia movilla Dall and Bartsch, 1909

Plate 60, fig. 1

Bulletin 68, United States National Museum, 213; Pl. 25, fig. 1.

Shell elongate-ovate, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls feebly rounded in the middle, strongly so at the sloping shouldered summit, and moderately contracted at the suture. Periphery weakly angulated. Base rather long, moderately rounded, sloping gently from the periphery to the umbilical area. Suture well-impressed. Entire surface of spire and base marked by fine retractive lines of growth and numerous, very fine, closely spaced, wavy, spiral striations. Aperture broadly oval, posterior angle obtuse; outer lip thin; columella slender, very strongly curved, very oblique, provided with a deep-seated fold at its insertion; parietal wall covered with a thin callus. Length, 3.6; diameter, 1.7 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206922. Type locality, United States Bureau of Fisheries Station 2936, in 359 fathoms, off San Diego, California.

RANGE. Known only from type locality.

Odostomia nemo Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 198; Pl. 22, fig. 8.

Shell elongate-conic, milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened in the middle, moderately contracted at the suture, and roundly shouldered at the summit. Sutures strongly impressed. Periphery and base of the last whorl somewhat inflated, well-rounded, the latter very frequently narrowly umbilicated. Entire surface of spire and base marked by vertical lines of growth and numerous exceedingly fine, spiral striations. Aperture ovate, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella thin, curved, strongly reflected, provided with a fold at its insertion; parietal wall glazed with a thin callus. Length, 4.8; diameter, 2.4 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 206911. Type locality, San Diego, California.

RANGE. San Pedro to San Diego, California.

Odostomia notilla Dall and Bartsch, 1909

Plate 60, fig. 6

Bulletin 68, United States National Museum, 213; Pl. 25, fig. 6.

Shell very elongate, ovate, yellowish-white. Nuclear whorls deeply obliquely immersed in the first of the suceeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, feebly contracted at the sutures, narrowly subtabulately shouldered at the summit. Suture strongly marked. Periphery of the last whorl marked by a low raised cord, which renders it decidedly angulated. Base short, well-rounded, somewhat pinched in at the umbilical area. Entire surface of the spire and base marked by almost vertical lines of growth and numerous, very fine, well-incised, spiral striations. Aperture ovate, posterior angle acute; outer lip thin; columella slender, slightly curved, provided with a fold at its insertion; parietal wall covered with a thick callus. Length, 2.7; diameter, 1.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206921. Type locality, University of California Station 30, off Catalina Island, California.

Range. Known only from type locality.

Odostomia nunivakensis Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 194; Pl. 22, fig. 6.

Shell elongate-ovate, deeply umbilicated, milk-white. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls increasing very regularly in size, rather high between the sutures, well-rounded with strongly tabulated summits. Suture strongly marked. Periphery and base of the last whorl well-rounded, umbilicus bounded by a slender thread. Aperture elongate-ovate, posterior angle obtuse; outer lip thin; columella slender, ε-shaped, slightly revolute, free from the base, armed with a strong fold near its center. Entire surface crossed by fine lines of growth and exceedingly fine, closely spaced, wavy, spiral striations. Length, 3; diameter, 1.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 159476. Type locality, Nunivak Island, Alaska.

Range. Known only from type locality.

Odostomia obesa Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 203; Pl. 26, fig. 4.

Shell large, ovate, yellowish-white. Nuclear whorls very small, very deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls inflated, very strongly rounded, weakly contracted at the sutures, appressed at the summit, marked by numerous, very retractive, lines of growth, and on the first three whorls by strongly incised spiral lines, of which 6 occur upon the first, 17 upon the second, 25 upon the third whorl between the sutures, while on the last whorl they are less strongly expressed and more numerous. Periphery and base of the last whorl inflated, well-rounded, marked like the space between the sutures of the last whorl. Aperture broadly ovate; posterior angle acute; outer lip thin, decidedly expanded anteriorly; columella short, strongly curved, revolute, re-enforced by the base and provided with a deep-seated fold at its insertion. Length, 6; diameter, 3.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206915. Type locality, San Pedro, California.

Range. Known only from type locality.

Odostomia phanea Dall and Bartsch, 1907
Plate 63, fig. 5

Proceedings of the United States National Museum, 33:528; Pl. 48, fig. 7.

Shell elongate-conic, subdiaphanous to milk-white, stout and shining. Nuclear whorls small, deeply immersed in the first of the succeeding turns. Post-nuclear whorls rather high between the sutures, well-rounded, with scarcely an indication of a shoulder at the summit, separated by well-marked sutures. Periphery and the rather long base of the last whorl well-rounded. The first two whorls are regularly closely spirally striated, in the third the striation becomes enfeebled and on the penultimate decidedly obsolete, while the base is smooth. About 18 of the striae are visible on the third turn. Aperture large, oval, somewhat effuse anteriorly; columella decidedly curved and reflected, re-enforced by the attenuated base, provided with a strong oblique fold at its insertion. Length, 4.8; diameter, 2.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 46408. Type locality, Monterey, California.

Range. Known only from type locality.

Odostomia phanella Dall and Bartsch, 1909
Plate 63, fig. 9

Bulletin 68, United States National Museum, 205; Pl. 23, fig. 9.

Shell ovate, vitreous, translucent. Nuclear whorls deeply, very obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls inflated, slightly contracted at the suture, appressed at the summit, marked by 8 strongly incised spiral lines on the first and second and 20 upon the third, between the sutures. Suture well-marked. Periphery and base of the last whorl well-rounded, marked by numerous spiral striations, which are a little weaker than those between the periphery and summit of the last whorl. Aperture oval; posterior angle obtuse; outer lip thin; columella moderately strong, decidedly curved and strongly revolute, provided with a strong fold at its insertion. Length, 3.3; diameter, 1.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 196348. Type locality, San Pedro Bay, California.

Range. San Pedro to San Diego, California.

Odostomia pratoma Dall and Bartsch, 1909

Plate 63, fig. 4

Bulletin 68, United States National Museum, 199; Pl. 23, fig. 4.

Shell elongate-ovate, bluish-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, strongly contracted at the sutures, with a rounded sloping shoulder at the summit. Periphery obsoletely angulated. Base well-rounded, with an obscure umbilical chink. Entire surface of base and spire marked by numerous, slightly retractive lines of growth and exceedingly fine, closely spaced, spiral striations. Aperture ovate; posterior angle obtuse; outer lip very thin; columella slender, strongly curved, slightly revolute, provided with a weak, deep-seated fold at its insertion. Length, 2.9; diameter, 1.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206913. Type locality, United States Bureau of Fisheries Station 2902, in 53 fathoms, off Santa Rosa Island, California.

Range. Known only from type locality.

Odostomia profundicola Dall and Bartsch, 1909

Plate 60, fig. 8

Bulletin 68, United States National Museum, 214; Pl. 25, fig. 8.

Shell turreted, milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, slightly contracted at the sutures, broadly tabulately shouldered at the summit. Periphery and base of the last whorl somewhat inflated, strongly rounded. Entire surface of spire and base marked by numerous vertical lines of growth and exceedingly fine microscopic, closely spaced, spiral striations. Aperture very large, ovate; posterior angle obtuse; outer lip thin; columella slender, somewhat twisted, oblique, slightly revolute, provided with a deep-seated fold. Length, 4.5; diameter, 2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206924. Type locality, United States Bureau of Fisheries Station 2963, in 359 fathoms, off San Diego, California.

Range. Point Vincente to San Diego, California, deep water.

Odostomia quadrae Dall and Bartsch, 1910

Canada Department of Mines, Geological Survey Branch, *Memoir No. 14N:* 17; Pl. 2, fig. 6.

Shell elongate-ovate, milk-white, umbilicated. Nuclear whorls deeply, obliquely immersed in the first of the post-nuclear turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, moderately shouldered at the summit, marked by faint, slightly retractive lines of growth, and numerous, exceedingly fine, microscopic, spiral striations. In addition to this sculpture, the last whorl shows many weak malleations. Periphery of the last whorl and the moderately long base somewhat inflated, well-rounded, marked like the spire. Aperture large, oval; posterior angle acute; outer lip thin; columella very oblique, slightly curved and strongly revolute, extending partly over the umbilicus, provided with a moderately strong fold a little anterior to its insertion; parietal wall glazed with a thin callus. Length, 6.2; diameter, 3.2 mm. (Dall and Bartsch.)

Type in Geological Survey Museum, Ottawa; specimens in United States National Museum, No. 211540. Type locality, ship channel, Barkley Sound, Vancouver Island, British Columbia.

Range. Known only from type locality.

Odostomia raymondi Dall and Bartsch, 1909

Plate 60, fig. 9

Bulletin 68, United States National Museum, 212; Pl. 25, fig. 9.

Shell regularly conic, milk-white. Nuclear whorls very obliquely deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which gives the spire a decidedly truncated aspect. Post-nuclear whorls well-rounded, slightly shouldered at the summit, marked by a raised spiral thread at the decidedly angulated periphery. The summits of the whorls fall a little anterior to the periphery, and cause the sutures to appear subchanneled. Base short, well-rounded. Entire surface of base and spire marked by strongly retractive lines of growth and numerous closely spaced spiral striations. Aperture oval, posterior angle acute; outer lip thin; columella curved, reflected, re-enforced by the base and provided with a moderately strong fold at its insertion. Length, 3.6; diameter, 1.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206920. Type locality, University of California Station 30, off Catalina Island.

Range. Known only from type locality.

Odostomia resina Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 216; Pl. 27, fig. 6.

Shell very small, vitreous, transparent. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls inflated, strongly rounded, decidedly contracted at the suture, and appressed at the summit, where the preceding whorl is reflected through it, and gives the summit the false appearance of having a spiral cord. Suture strongly constricted. Periphery and base of the last whorl well-rounded. Entire surface of the shell marked by lines of growth which are of varying strength, and numerous, closely spaced, exceedingly fine, spiral striations. Aperture ovate, posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, strongly curved, slightly revolute, re-enforced by the base, provided with a fold at its insertion. Length, 2.2; diameter, 1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206925. Type locality, Arch Beach, California.

Range. Known only from type locality.

Odostomia santarosana Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 205; Pl. 26, fig. 6.

Shell elongate-ovate, light olive. Nuclear whorls very deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls much broader at the moderately constricted suture than at the feebly shouldered summit; well-rounded. The first 4 are marked by strongly incised spiral lines, of which 7 occur upon the second, 10 upon the third, and 13 upon the fourth, of which the 5 immediately below the summit are finer and closer spaced than the rest, which are equal. The entire surface of the last whorl is marked by numerous very fine, closely spaced, wavy, spiral striations. Suture well-impressed. Periphery and base of the last whorl inflated and well-rounded. Aperture oval; posterior angle acute; outer lip thin; columella moderately strong, decidedly curved, somewhat reflected, re-enforced by the base, provided with a fold at its insertion. Length, 4.9; diameter, 2.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 56770. Type locality, Santa Rosa Island, California.

Range. Known only from type locality.

Odostomia serilla Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 209; Pl. 24, fig. 9.

Shell elongate-conic, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, rather high between the sutures, contracted at the periphery, strongly, narrowly tabulately shouldered at the summit. Suture strongly marked. Periphery of the last whorl and the rather long base well-rounded. Entire surface of spire and base marked by numerous lines of growth and well-incised spiral striations. Aperture ovate, posterior angle acute; outer lip thin; columella strongly curved, slightly revolute, provided with a fold at its insertion. Length, 4.8; diameter, 2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206917. Type locality, University of California Station 59, off San Diego, California.

Range. Known only from type locality.

Odostomia septentrionalis Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 200; Pl. 26, fig. 9.

Shell very elongate, ovate, thin, umbilicated, soiled yellowish-white. Nuclear whorls small, smooth, very obliquely, deeply immersed in the first of the succeeding turns. Post-nuclear whorls inflated, well-rounded, summits appressed, marked by fine, retractive lines of growth and numerous fine, wavy, spiral striations between the sutures and on the base. The posterior half of the base has, in addition to the above markings, three broad, low, feeble, raised, spiral threads. Umbilicus very narrow. Aperture large, very regularly oval; posterior angle obtuse, the thin outer lip bending strongly outward in a broad sweeping curve; columella long, slender, regularly curved and moderately reflected, not re-enforced by the base; provided with a feeble oblique fold at its insertion; parietal wall glazed with a thin callus. Length, 4.3; diameter, 2.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 159462. Type locality, Unalaska, Alaska.

Range. Known only from type locality.

Odostomia sitkaënsis Clessin, 1900

Martini and Chemnitz, *Conchylien Cabinet,* 2d ed., Pyramidella, 121:30; fig. 1.

T. parva, acute-conica, non rimata, glabra, nitida, opaca, solidula, flavescente-albida; spira acuta; anfractu 6 parum convexi, lente et regulariter accrescentes, sutura profunda separati. anfr. ultimus ad basin rotundatus; apertura acute-ovata, ⅓ long. testae aequans, superne acuminata, labro acuto, arcuato, columella arcuata, dente parum prominente armata, labio interno angusto. Lg., 4; diameter, 1.5 mm. (Clessin.)

Shell elongate-conic, very regular in outline, yellowish-white, shining. Nuclear whorls almost completely immersed in the first of the succeeding volutions. Post-nuclear whorls moderately rounded, rather high between the sutures, slightly shouldered at the summits, marked by many fine lines of growth and numerous fine wavy spiral striations; the latter are more regularly developed and distributed than the lines of growth. (Our figure does not show the spiral markings.) The periphery of the last whorl marks the greatest diameter of the shell. The base, though rather long, falls off rather abruptly at the periphery, then tapers gradually to the anterior end of the columella; it is marked like the spaces between the sutures. Aperture large, oval; posterior angle acute, outer lip decidedly curved, almost patulous, thin; columella long, slender, gently curved, and somewhat reflected, provided with a moderately strong, oblique fold near its insertion; parietal wall without callus. The Berlin collection contains two specimens of this species, No. 26232, from Sitka, Alaska. (Dall and Bartsch.)

TYPE in Berlin Museum, No. 26232. Type locality, Verbreitung, Sitka, Alaska.

RANGE. Known only from type locality.

Odostomia skidegatensis Bartsch, 1912

Plate 61, fig. 1

Proceedings of the United States National Museum, 42:284; Pl. 38, fig. 7.

Shell elongate-conic, yellowish-white. Nuclear whorls completely immersed in the first of the succeeding turns, above which only half of the last turn projects. Post-nuclear whorls very slightly rounded, feebly shouldered at the summit, marked by incised spiral lines, which are much stronger on the first two volutions than on the remaining. Of these lines, 10 appear upon the second turn. On the last, they are reduced to exceedinly fine striations. Sutures moderately constricted. Periphery of the last whorl decidedly inflated and feebly angulated. Base somewhat prolonged, moderately rounded, marked by fine, closely spaced, spiral striations. Aperture large, oval; posterior angle acute; outer lip thin; inner lip strong, moderately curved, and partly reflected over the base to which it is appressed, provided with a strong fold at its insertion. Length, 3.4; diameter, 1.6 mm. (Bartsch.)

Cotypes in Geological Survey of Canada and United States National Museum, No. 220116. Type locality, Skidegate, Queen Charlotte Islands, British Columbia.

Range. Skidegate, Queen Charlotte Islands, British Columbia, to Trinidad, California.

Odostomia spreadboroughi Dall and Bartsch, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N,* 17; Pl. 2, fig. 2.

Shell elongate-ovate, somewhat translucent, bluish-white. Nuclear whorls small, deeply, very obliquely immersed within the first of the succeeding turns. Post-nuclear whorls flattened in the middle, rounded strongly at the summit and the suture, marked by decidedly sinuous, exceedingly fine lines of growth and fine spiral striations; the latter are less strongly developed on the posterior two-thirds between the sutures than on the anterior third and on the base. Sutures strongly constricted. Periphery of the last whorl and base inflated, well-rounded, the latter deeply and strongly umbilicated. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella very slender, strongly curved and slightly revolute, provided with a very faint, oblique fold a little anterior to its insertion; parietal wall glazed with a thin callus. Length, 3.8; diameter, 1.9 mm. (Dall and Bartsch.)

Type in Geological Survey Museum, Ottawa, and in United States National Museum, No. 211541. Type locality, ship channel, Barkley Sound, Vancouver Island, British Columbia.

Range. Known only from type locality.

Odostomia stephensae Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 210; Pl. 24, fig. 5.

Shell elongate-conic, bluish-white. Nuclear whorls almost completely immersed in the first of the succeeding turns, above which only the outer edge of the last volution projects. Post-nuclear whorls rather high between the sutures, moderately rounded, ornamented by numerous, fine but well-incised, subequal and subequally spaced, spiral lines; about thirty-three of which appear between the summit and the periphery of the last whorl. Suture well-marked. Periphery of last whorl well-rounded. Base rather prolonged, well-rounded, its entire surface marked by incised spirals like the spaces between the sutures. In addition to the spiral markings the entire surface shows fine incremental lines. Aperture elongate-oval, effuse at the junction of the outer lip and the columella; posterior angle obtuse; columella stout, curved, and decidedly reflected over the re-enforced base, provided with a strong oblique fold opposite the obsolete umbilical chink; parietal wall covered with a thin callus. Length, 5.3; diameter, 2.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 204010. Type locality, Bear Bay, Peril Straits, Baranoff Island, Alaska.

Range. Bear Bay, Peril Straits, Alaska, to Barkley Sound, British Columbia.

Odostomia tacomaënsis Dall and Bartsch, 1907

Plate 66, fig. 10

Proceedings of the United States National Museum, 33:526; Pl. 47, fig. 10.

Shell ovate, yellowish. Nuclear whorls small, deeply immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, faintly roundly shouldered at the extreme summits. Periphery of the last whorl rounded. Base inflated, well-rounded, somewhat attenuated anteriorly. Surface covered by numerous, equal and equally closely spaced, slender, wavy, spiral striations of which there are about 40 between the summit and the periphery of the last whorl. Base marked like the space posterior to it. In addition to the spiral sculpture the entire surface of the shell is crossed by numerous fine lines of growth. Aperture moderately large, oval, well-rounded anteriorly; posterior angle acute; outer lip thin; columella curved, slightly reflected, re-enforced, except at its extreme anterior end, by the attenuated base and provided with a strongly oblique fold at its insertion. Length, 4.3; diameter, 2.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 159267. Type locality, Tacoma, Washington.

Range. Known only from type locality.

Odostomia tenuisculpta Carpenter, 1864

Plate 63, fig. 2; Plate 66, fig. 6

Supplementary Report, British Association for the Advancement of Science, 659. *Bulletin 68,* United States National Museum; Pl. 23, fig. 2.

O. testa ovoidea, subelevata, albida, tenui, diaphana; anfr. nucl. subverticaliter immersis, angustis; norm. iii., parum tumidis, subturis impressis, sulculis spiralibus latioribus haud impressis, distantibus, in spira iii., circa basim rotundatum circ. vi. subobsolatis; apertura ovata; plica acuta, declivi, parva, parieti contigua; labro acuto; labio indistincto; columella antice parum effusa. Long., 0.1; long. spir., 0.04; lat., 0.06 poll. (Carpenter.)

Shell elongate-ovate, yellowish, with the early whorls spirally lirate and the later ones only obsoletely so. Nuclear whorls small, smooth, obliquely, almost completely, immersed in the first of the succeeding turns. Post-nuclear whorls evenly well-rounded with appressed summits. The first three marked between the sutures by many subequal lirae of which there are about fifteen on the second turn. On the last two turns these lirations become quite obsolete. Periphery and base of the last whorl inflated and well-rounded, marked by very feeble spiral striations and lines of growth. Aperture moderately large, oval; somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella strongly curved, re-enforced partly by the attenuated base, moderately reflected anteriorly, bearing a strong fold at its insertion, which appears as if it were the inflected termination of the columella. (Bartsch.)

Type in United States National Museum, No. 15520. Type locality, Neah Bay, Washington.

Range. Barkley Sound, Vancouver Island, to Lower California.

Odostomia thea Bartsch, 1912

Proceedings of the United States National Museum, **42**:278; Pl. 37, fig. 7; Pl. 38, fig. 13.

Shell moderately large, elongate-ovate, yellowish-white. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, rather high between the sutures, slightly shouldered at the summit, crossed by numerous fine, decidedly retractive lines of growth. The spiral sculpture is strong on the early whorls, becoming gradually finer with the growth of the shell. The first two turns are divided into five, almost equal areas by four equally, strongly incised, spiral lines, between the sutures. On the third whorl the spiral lines are increased to about a dozen and are considerably less strong; on the succeeding turn they are probably almost tripled and still weaker; while on the penultimate volution the sculpture consists of somewhat wavy, closely spaced, spiral striations. Periphery of the last whorl obscurely angulated, somewhat inflated; base moderately long, curving gently to the anterior portion of the shell, marked like the body whorl with fine, spiral lines.

Sutures somewhat constricted. Aperture moderately large, oval; posterior angle obtuse; outer lip thin; inner lip rather long, slightly curved, and somewhat revolute, provided with a strong fold at its insertion; parietal wall glazed with a thin callus. Length, 4.7; diameter, 2.2 mm. (Bartsch.)

TYPE in United States National Museum, No. 211556. Type locality, San Pedro, California.

RANGE. Known only from type locality.

Odostomia tillamookensis Dall and Bartsch, 1907

Plate 66, fig. 1

Proceedings of the United States National Museum, 33:522; Pl. 47, fig. 1.

Shell elongate-conic, thin yellowish-white. Nuclear whorls surrounded by the first of the succeeding turns and so immersed as to give the apex a broadly truncated appearance. Post-nuclear whorls inflated, evenly strongly rounded, very slightly shouldered at the summit, separated by well-marked sutures. Periphery and base of the last whorl well-rounded, the latter inflated, narrowly openly umbilicated. Entire surface marked by numerous fine, wavy, subequal, weakly incised, spiral lines, of which about 35 occur between the summit and the periphery of the last whorl and about an equal number on the base. Aperture oval; outer lip thin; columella slender, evenly gently curved, and slightly revolute, free, not re-enforced at the base, provided with a slender fold at its insertion, which is not visible when the aperture is viewed squarely. Length, 4.1; diameter, 2.2 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 196244. Type locality, United States Fisheries Steamer "Albatross" Station 3346, off Tillamook, Oregon, in 786 fathoms.

RANGE. Known only from type locality.

Odostomia unalashkensis Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 203; Pl. 26, fig. 5.

Shell elongate-ovate, stout and strong, light yellow. (Nuclear whorls decollated.) Post-nuclear whorls flattened on their outer three-fourths, rounding suddenly to the closely appressed summit, on the posterior fourth. Entire surface of the shell marked by lines of growth and numerous, equal and equally spaced, well-marked, spiral striations, of which about 28 occur between the sutures of the penultimate whorl. Sutures well-impressed. Periphery of the last whorl somewhat angulated. Base elongated, rounded, marked like the spire. Aperture ovate, slightly effuse anteriorly, posterior angle acute; outer lip thin; columella short, strongly curved and reflected, re-enforced for the greater part by the attenuated base and provided with a strong oblique fold at its insertion; parietal wall covered by a thin callus. Length, 4.8; diameter, 2.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 150464a. Type locality, Captain's Harbor, Unalaska, Alaska.

Range. Known only from type locality.

Odostomia valdezi Dall and Bartsch, 1907

Plate 63, fig. 6

Proceedings of the United States National Museum, 33:526; Pl. 48, fig. 2.

Shell small, thin, very elongate-oval, subdiaphanous to milk-white, having the entire surface marked by rather strong lines of growth and numerous microscopic spiral striations. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last turn is visible. Post-nuclear turns rather high between the sutures, well-rounded, with narrowly roundly shouldered summits. Periphery and base of the last turn inflated and well-rounded, the latter with a very narrow umbilical chink. Aperture moderately large, oval; posterior angle acute; columella strongly curved, re-enforced by the attenuated base and provided with a moderately strong fold opposite the umbilical chink. Length, 3; diameter, 1.3 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 196249. Type locality, off Del Monte, Monterey, California.

Range. Known only from type locality.

Odostomia vancouverensis Dall and Bartsch, 1910

Canada, Department of Mines, Geological Survey Branch, *Memoir No. 14-N,* 18; Pl. 2, fig. 7.

Shell elongate-ovate, very narrowly umbilicated, turreted, yellowish-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only half of the last volution projects and extends beyond the outline of the spire. Post-nuclear whorls broadly, tabulatedly shouldered at the summit, moderately rounded, marked by almost vertical lines of growth and numerous exceedingly fine spiral striations. Sutures rendered very conspicuous by the tabulated shoulder. Periphery of the last whorl well-rounded, base moderately long, well-rounded, marked like the spire. Aperture large, elongate-ovate, somewhat effuse anteriorly; posterior angle decidedly obtuse; outer lip thin; columella slender, oblique, and somewhat revolute, provided with an oblique fold a little anterior to its insertion; parietal wall glazed with a thin callus. Length, 4.7; diameter, 2.2 mm. (Dall and Bartsch.)

Type in Geological Survey Museum, Ottawa, and others in United States National Museum, No. 211539. Type locality, ship channel, Barkley Sound, Vancouver Island, British Columbia.

Range. Known only from type locality.

Odostomia willetti Bartsch, 1917

Proceedings of the United States National Museum, **52**:666; Pl. 43, fig. 6.

Shell large, elongate, conic, bluish-white. Nuclear whorls obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls moderately rounded, appressed at the summit, the early ones marked by a moderate number of strongly incised lines, while on the later whorls the incised spiral lines are finer and much more numerous; in addition to the spiral sculpture the whorls are marked by decidedly retractively slanting, incremental lines. Suture moderately constricted. Periphery of the last whorl inflated, feebly angulated. Base attenuated, moderately rounded. Aperture oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin; inner lip very oblique, stout, slightly curved, reflected over and appressed to the base, provided with a strong oblique fold at its insertion; parietal wall covered with a thick callus. Length, 5.8; diameter, 2.4 mm. (Bartsch.)

Type in United States National Museum, No. 274007. Type locality, Waterfall Cannery, west side of Prince of Wales Island, Alaska.

Range. Known only from type locality.

Odostomia youngi Dall and Bartsch, 1912

Proceedings of the United States National Museum, **42**:277; Pl. 37, fig. 6.

Shell elongate-conic, umbilicated, milk-white. Nuclear whorls small, obliquely immersed in the first of the post-nuclear turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, with a narrow, tabulately shouldered summit, marked by equally spaced, rather strong, spiral striations, of which about 32 occur between the summit and the periphery on the penultimate turn. Periphery and base of the last whorl inflated, well-rounded, marked with spiral sculpture equal in strength and disposition to that on the spire. Sutures strongly impressed. In addition to the spiral sculpture, the whorls are marked with curved retractive lines of growth. Aperture pear-shaped; posterior angle acute; outer lip thin; inner lip slender, curved, and somewhat revolute, provided with a strong oblique fold a little anterior to its insertion; parietal wall glazed with a thick callus. Length, 6.5; diameter, 2.4 mm. (Dall and Bartsch.)

Type in Geological Survey Museum, Ottawa, and United States National Museum, No. 211542. Type locality, ship channel, Barkley Sound, Vancouver Island, British Columbia.

Range. Known only from type locality.

Subgenus Amaura Moller, 1842

Odostomia arctica Dall and Bartsch, 1909

Plate 64, fig. 5

Bulletin 68, United States National Museum, 224; Pl. 28, fig. 5.

Shell large, elongate-ovate, straw-yellow. (Nuclear whorls decollated.) Post-nuclear turns well-rounded, with subtabulate summits, marked by lines of growth and numerous, fine, closely-placed, wavy, spiral striation. Periphery well-rounded. Suture well-impressed. Base rather elongated, marked like the space between the sutures. Aperture pear-shaped, rather narrow posteriorly, and somewhat effuse anteriorly, posterior angle rendered obtuse by the tabulation; outer lip thin; columella short, curved, slightly reflected, re-enforced by the attenuated base and provided with a weak fold at its insertion; parietal wall covered by a thin translucent callus. Length, 12.4; diameter, 6.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 168766. Type locality, Hagemeister Island, Bering Sea.

Range. Seahorse Islands, Arctic Ocean, to Bristol Bay, Bering Sea.

Odostomia avellana Carpenter, 1865

Plate 64, fig. 3

Annals and Magazine of Natural History, series 3, 15:30. *Bulletin 68,* United States National Museum; Pl. 27, fig. 3.

O. testa *O. nuciformi* indole simili, sed spira valde prolongata. Long., .32; long. spir., .16; lat., .16 poll. (Carpenter.)

Shell large, elongate-ovate, yellowish to milk-white. Nuclear whorls deeply vertically immersed; only part of the last volution is visible when viewed from above, their axis evidently being at a right angle to the axis of the later whorls. Post-nuclear whorls increasing rapidly in size, early ones well-rounded, later ones less so, their summits being closely appressed to the preceding whorl. Suture well-impressed, simple. Periphery and base of the last whorl well-rounded, the latter somewhat elongated. Aperture large, ovate, somewhat effuse anteriorly, milk-white within; columella short, curved; re-enforced partly by the attenuated base, having a strong oblique fold at its insertion; parietal wall covered by a moderately strong callus. (Bartsch.)

Type in United States National Museum, No. 15517b. Type locality, Neah Bay, Washington.

Range. Known only from type locality.

Odostomia beringi Dall, 1871

American Journal of Conchology, **7**:117. *Bulletin 68,* United States National Museum; Pl. 27, fig. 8.

Shell small, white, thin, short, broad, and pointed. Whorls five, flattened toward the apex. Suture not impressed. Surface smooth or marked with faint lines of growth. Aperture less than half as long as the shell; rounded in front, sharply angulated at the suture. Peristome thin. Columellar fold distinct, close to the body whorl. A deep groove behind the inner lip extends into a distinct tubular umbilical perforation, which is not encroached upon by the inner lip. Long., .22; lat., .13 in. (Dall.)

Type in United States National Museum, No. 169456. Type locality, St. Michael, Norton Sound, Alaska.

Range. Known only from type locality.

Odostomia canfieldi Dall, 1908

Plate 64, fig. 2

Nautilus, **31**:131. *Bulletin 68,* United States National Museum; Pl. 28, fig. 2, 1909.

Shell large, similar in form to *O. (A) avellana;* white, shining. Nuclear whorls 3, helicoid, quite elevated, deeply immersed in the first of the succeeding whorls, having their axis at a right angle to the axis of the latter whorls. Post-nuclear whorls well-rounded, with a beveled shoulder at the summits. Suture well-marked, simple. Periphery and base of the last whorl well-rounded and inflated, the latter somewhat elongated. Aperture subovate, somewhat effuse anteriorly; posterior angle acute; outer lip thin at the edge, thick within; columella curved and somewhat revolute, having a prominent oblique fold near its insertion; parietal wall covered by a thin callus. Length, 9.6; diameter, 5.1 mm. (Dall.)

Type in United States National Museum, No. 46473. Type locality, Monterey, California.

Range. Barkley Sound, British Columbia, to San Diego, California.

Odostomia eldorana Bartsch, 1912

Proceedings of the United States National Museum, **42**:287; Pl. 38, fig. 12.

Shell elongate, conic, wax-yellow. (Nuclear whorls decollated.) Post-nuclear whorls moderately well-rounded, slightly constricted at the sutures, feebly roundly shouldered at the summit, marked with lines of growth and very fine spiral striations. Periphery of the last whorl well-rounded. Base slightly protracted, well-rounded, very narrowly umbilicated. Aperture elongate-ovate; posterior angle acute; outer lip thin at the edge; inner lip very oblique, somewhat sinuous, reflected over and adnate to the base, provided with a moderately strong fold, a little anterior to its insertion; parietal wall closed by a very thin callus. Length, 9; diameter, 4 mm. (Bartsch.)

Type in United States National Museum, No. 34246. Type locality, Kodiak Island, Alaska.

Range. Known only from type locality.

Odostomia elsa Dall and Bartsch, 1909

Plate 62, fig. 1

Bulletin 68, United States National Museum, 220; Pl. 29, fig. 1.

Shell ovate, umbilicated, yellowish-white. Nuclear whorls very small, deeply immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, with strongly concave summits, forming deeply channeled sutures, marked by slightly retractive lines of growth, and exceedingly fine, closely placed, wavy, spiral striations. Periphery of the last whorls well-rounded. Base short, inflated, moderately umbilicated, marked like the spire. Aperture ovate, posterior angle obtuse; columella curved, slightly reflected, not re-enforced by the base, provided with an obtuse fold some little distance anterior to its insertion; parietal wall covered by a thin callus. Length, 6.1; diameter, 3.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 55811. Type locality, Kodiak Island, Alaska.

Range. Known only from type locality.

Odostomia engbergi Bartsch, 1920

Journal of the Washington Academy of Sciences, **10**:1920.

Shell elongate-ovate, yellow, a little paler toward the tip. Nuclear whorls eroded in all the specimens seen. Post-nuclear whorls narrowly tabulately shouldered at the summit, quite strongly rounded, marked by very fine slightly slanting lines of growth and equally fine spiral striations, the combination, when viewed under the microscope, giving to the surface a cloth-like texture. Suture strongly marked. Periphery of the last whorl inflated, strongly rounded. Base strongly rounded. Aperture narrowly ovate; posterior angle very obtuse; outer lip thin; inner lip short, very oblique, somewhat sinuous, reflected over the base and appressed to it except at the extreme tip, which alone is free; a strong fold is present on the inner lip a little anterior to its insertion; parietal wall covered by a thin callus. Altitude, 7; diameter, 3.4 mm. (Bartsch.)

Type in United States National Museum, No. 334492. Type locality, off San Juan Island, Puget Sound.

Range. San Juan Islands, Gulf of Georgia.

Odostomia farallonensis Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 221; Pl. 27, fig. 7.

Shell very elongate-ovate, deeply umbilicated, light-yellow. Nuclear whorls very deeply immersed. Post-nuclear whorls very slightly rounded in the middle between the sutures, more strongly so near the anterior end and toward the summit. Summit strongly narrowly tabulate. Periphery of the last whorl inflated. Base very strongly suddenly rounded, widely and deeply umbilicated. Entire surface marked by numerous fine, closely-spaced, spiral striations. Aperture broadly ovate, posterior angle obtuse, outer lip thin; columella very slender, strongly curved, revolute, provided with a deep fold a little below its insertion; parietal wall glazed with a thin callus. Length, 5.5; diameter, 2.7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 168827. Type locality, United States Bureau of Fisheries Station 3180, off the Farallon Islands, California.

Range. Known only from type locality.

Odostomia grippiana Bartsch, 1912

Proceedings of the United States National Museum, **42**:287; Pl. 38, fig. 11.

Shell large, umbilicated, yellowish-white. Nuclear whorls decollated. Post-nuclear whorls decidedly, slopingly, tabulately shouldered at the summit, otherwise moderately rounded; marked by fine incremental lines and numerous, equal and equally spaced, slender, wavy, spiral threads, of which 6 occur upon the shoulder, and about 40 between the shoulder and the suture. Periphery and the moderately long base of the last whorl well-rounded, marked like the spire. Aperture moderately long, stout, curved, somewhat reflected, provided with a strong fold a little anterior to its insertion; parietal wall glazed with a thin callus. Length, 7.5; diameter, 0.4 mm. (Bartsch.)

Type in United States National Museum, No. 211559. Type locality, Nanaimo, British Columbia.

Range. Known only from type locality.

Odostomia helena Bartsch, 1912

Plate 67, fig. 2

Proceedings of the United States National Museum, 42:286; Pl. 38, fig. 10.

Shell moderately large, yellowish-white, very elongate-ovate. Nuclear whorls small, very obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls subtabulately shouldered at the summit, well-rounded, apparently marked by incremental lines only. Sutures strongly constricted. Periphery of the last whorl somewhat inflated, well-rounded. Base short, well-rounded, broadly umbilicated, marked like the spire. Aperture moderately large, ovate; posterior angle obtuse; outer lip evenly curved; inner lip sinuous, reflected over, but not adnate to the base, provided with a strong, oblique fold, which is about one-third of the distance of the length of the inner lip anterior to the insertion of the inner lip. Parietal wall covered with a thick callus. Length, 5; diameter, 2.7 mm. (Bartsch.)

Type in United States National Museum, No. 249904. Type locality, San Pedro, California.

Range. Known only from type locality.

Odostomia iliuliukensis Dall and Bartsch, 1909

Plate 62, fig. 4

Bulletin 68, United States National Museum, 227; Pl. 29, fig. 4.

Shell very elongate-conic, heavy, very light-yellow. Nuclear whorls small, almost completely obliquely immersed in the first of the succeeding turns. Post-nuclear whorls rather high between the sutures, well-rounded, with narrowly tabulate summits, marked by fine, retractive lines of growth and numerous fine, closely-spaced, spiral striations. Suture well-marked. Periphery of the last whorl well-rounded. Base rather prolonged, evenly rounded, marked like the spire. Aperture pear-shaped, posterior angle obtuse; outer lip thin at the edge, thickened within; columella twisted, strongly curved anteriorly, where it is also reflected and re-enforced by the base, provided with a low fold at its insertion; parietal wall glazed by a thin callus. Length, 9.5; diameter, 4.6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 159463. Type locality, off Iliuliuk Village, Captain's Bay, Unalaska, Alaska.

Range. Known only from type locality.

Odostomia kennerlyi Dall and Bartsch, 1907

Plate 64, fig. 8

Proceedings of the United States National Museum, 33:529; Pl. 48, figs. 8, 8*a*.

Shell large, very thin, broadly conic, umbilicated, yellowish-white; marked by subobsolete, subequal, and subequally spaced spiral wrinkles, about fifteen of which may be seen on the body and base of the last whorl. In addition to these wrinkles, many faint, closely placed spiral and vertical striae are present. Nuclear whorls small, about two and one-half, forming a depressed spire which is deeply immersed, the axis of which is almost at right angles to the axis of the later whorls. Post-nuclear whorls very wide, inflated, well-rounded, faintly shouldered at the summit. Suture well-marked, simple. Periphery and base of the last whorl inflated, well-rounded, the latter decidedly contracted and narrowly umbilicated. Aperture large, suboval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thin; columella straight, obliquely inserted, revolute, not re-enforced by the base, with an oblique weak fold near its insertion; parietal wall apparently without a callus. Length, 10.2; diameter, 6 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 150564. Type locality, Nanaimo, British Columbia.

Range. Nanaimo, British Columbia, to Monterey, California.

Odostomia krausei Clessin, 1900

Plate 62, fig. 5

Martini and Chemnitz, *Conchylien Cabinet,* 2d ed., Pyramid, 115; Pl. 28, fig. 1.

T. conica, vix rimata, glabra, solida, opaca, albida, nitens; spira curta; anfractibus 6 lente et regulariter accesceptibus, parum convexis, sutura profunda separatis; ultimus ad basin rotundatus; apertura one-third long. testae superans, ovata, superno acuminata, labro acuto, arcuato, columella contorta, dente acutissimo munita; labio angusto. Long., 10; diameter, 4.5 mm. (Clessin.)

Shell elongate-conic, thick and heavy, rough through erosion, yellowish-white. (Nuclear whorls decollated in the type; judging from the pit in the apex they are probably deeply, obliquely immersed.) Post-nuclear whorls only moderately rounded, somewhat shouldered at the summit (surface decidedly eroded). Periphery and base of the last whorl well-rounded, the latter with a minute umbilical chink. Aperture auricular, somewhat effuse anteriorly, posterior angle scarcely acute; outer lip very thick, reflected, pillar with a broad, strong, oblique fold, a little anterior to its insertion; parietal wall covered by a thick callus. (Dall and Bartsch.)

Type in Killisnoo Museum, Berol, No. 36336. Type locality, Verbretung, Japan.

Range. Kodiak to Killisnoo, Alaska.

Odostomia lastra Dall and Bartsch, 1909

Plate 64, fig. 7

Bulletin 68, United States National Museum, 219; Pl. 28, fig. 7.

Shell thin, large, elongate-ovate, tapering very regularly to an acute point, narrowly umbilicated. Nuclear whorls very small, deeply obliquely immersed in the first of the succeeding whorls, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, moderately constricted at the sutures and narrowly shouldered at the summit, marked by numerous slender wavy spiral striations and fine lines of growth which give the surface a somewhat malleated appearance. Periphery and base of the last whorl strongly rounded, the latter narrowly umbilicated, marked like the spire. Aperture large, broadly oval, slightly effuse anteriorly; posterior angle acute; outer lip thin; columella slender, very oblique, almost straight, and somewhat reflected; parietal wall glazed with a thin callus. Length, 13.6; diameter, 7 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206928. Type locality, United States Bureau of Fisheries Station 2917, in 90 fathoms, off southern California.

Range. Catalina Island to San Diego, California.

Odostomia martensi Dall and Bartsch, 1906

Plate 62, fig. 3

Proceedings of the United States National Museum, 30:361; Pl. 25, fig. 5.

Shell ovoid, heavy, yellowish-white. Nuclear whorls small, almost completely immersed in the first of the succeeding volutions. Post-nuclear whorls increasing regularly and rapidly in size, inflated, subtabulately shouldered at the summit, marked by numerous fine lines of growth and equally abundant, closely placed, wavy, spiral striations. These lines of growth and spiral markings give the surface a finely reticulated appearance when viewed under high magnifications. (We have omitted this sculpture in our drawing, which should be considered as an outline sketch only.) Periphery and base of the last whorl decidedly rounded and inflated, marked like the space between the sutures. Aperture large, suboval, slightly effuse anteriorly, posterior angle acute; outer lip sharp at the edge but thick within; columella very strong, curved, re-enforced by the body whorl, from which the slightly reflected edge is separated only by a narrow line. A strong, oblique fold, not completely visible when the aperture is viewed squarely, is located a little anterior to the insertion of the columella. Length, 5.3; diameter, 3.1 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 36336. Type locality, Killisnoo, Alaska.

Range. Known only from type locality.

Odostomia moratora Dall and Bartsch, 1909

Plate 65, fig. 7

Bulletin 68, United States National Museum, 225; Pl. 30, fig. 7.

Shell elongate-ovate, imperforate, yellowish-white. Nuclear whorls decollated. Post-nuclear whorls strongly rounded, moderately contracted at the sutures, narrowly flatly shouldered at the summit; marked by strong lines of growth and subobsolete fine spiral lirations, which lend the surface a somewhat reticulated appearance. The spaces between the feeble lirations are marked by numerous very fine spiral striations. Periphery of the last whorl and base inflated, strongly rounded, marked like the spire. Aperture oval, posterior angle obtuse; outer lip thin; columella stout, oblique, revolute, provided with a strong fold a little below its insertion. Length, 9.5; diameter, 4.9 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 207261. Type locality, Point Reyes, California.

Range. Known only from type locality.

Odostomia nota Dall and Bartsch, 1909

Plate 64, fig. 6

Bulletin 68, United States National Museum, 226; Pl. 28, fig. 6.

Shell very elongate-ovate, light-yellow. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, slightly contracted at the sutures, narrowly tabulately shouldered at the summits, marked by numerous, closely-spaced, wavy, spiral striations. Periphery and base of the last whorl somewhat inflated, well-rounded, marked like the spire. Aperture ovate, posterior angle obtuse; outer lip thin; columella short, strongly curved, reflected and provided with a moderately strong fold a little anterior to its insertion. Length, 7.5; diameter, 3.5 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 46490. Type locality, San Diego, California.

RANGE. Santa Rosa Island to San Diego, California.

Odostomia nuciformis Carpenter, 1865

Plate 64, fig. 1

Annals and Magazine of Natural History, series 3, **15**:30. *Bulletin 68,* United States National Museum; Pl. 28, fig. 1.

O. testa magna, compacta, laevi, solida, alba; anfr. nucl.? . . . . (erosis), vertie submamillato; anfr. norm. v., subplanatis, subelongatis; spira brevi, marginibus valde excurvatis; basi elongata, haud umbilicata; apertura subovali, postice angusta; labro solido; labio tenui; plica antica, solida, obtusa, transversa, parietem haud attingente. Long., .3; long. spir., .14; lat., .18 poll. (Carpenter.)

Shell large, shortly ovate, yellowish to milk-white. Nuclear whorls deeply immersed; only half of the last turn is seen in tilted position when viewed from above. Post-nuclear whorls increasing rapidly in size, well-rounded, having their summits closely appressed to the preceding whorl. Suture moderately well-impressed. Periphery and base of the last whorl well-rounded. Aperture rather large, ovate, white within; posterior angle acute; outer lip moderately thin at the oblique fold at its insertion; re-enforced by the attenuated base; parietal wall covered by a thin callus. Length, 7.7; diameter, 4.4 mm. (Bartsch.)

TYPE in United States National Museum, No. 15517a. Type locality, Neah Bay, Washington.

RANGE. Known only from type locality.

Odostomia orcia Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 223; Pl. 27, fig. 3.

Shell elongate-ovate, narrowly umbilicated, yellowish-white. Nuclear whorls small, deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, moderately contracted at the sutures, and narrowly shouldered at the summit, marked by numerous, closely-spaced, wavy, spiral striations. Periphery and base of the last whorl inflated, well-rounded, the latter narrowly umbilicated, both marked by spiral sculpture like that of the spire. Aperture moderately large, ovate, posterior angle obtuse; outer lip thin; columella strongly curved and somewhat reflected, provided with a strong fold a little posterior to its insertion; parietal wall covered with a thin callus. Length, 7.7; diameter, 3.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206929. Type locality, Santa Rosa Island, California.

Range. Known only from type locality.

Odostomia pesa Dall and Bartsch, 1909

Plate 62, fig. 2

Bulletin 68, United States National Museum, 226; Pl. 29, fig. 2.

Shell elongate-ovate, very coarse and heavy. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns. Postnuclear whorls rather high between the sutures, well-rounded, with narrowly tabulate summits, marked by somewhat retractive lines of growth and numerous, closely placed, wavy, spiral striations. Sutures well-marked. Periphery of the last whorl well-rounded, marked like the spire. Base slightly prolonged, well-rounded. Aperture ovate, somewhat effuse anteriorly; posterior angle acute; outer lip very heavy; columella strong, flexuose with a strong, broad fold somewhat anterior to its insertion; parietal wall covered by a thin callus. Length, 9.3; diameter, 4.4 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 157458. Type locality, Kodiak Island, Alaska.

Range. Known only from type locality.

Odostomia sanjuanensis Bartsch, 1920

Journal of Washington Academy of Sciences, 10:571.

Shell elongate-ovate, wax-yellow. Nuclear whorls decollated. Postnuclear whorls narrowly tabulatedly shouldered, moderately rounded, marked by regular retractively slanting lines of growth and fine spiral striations, which give to the surface a cloth-like texture when subjected to high magnification. In addition to this sculpture, the surface of the shell is marked by strong incremental lines and more or less irregular and irregularly distributed, spiral threads, which produce a malleated pattern. Suture strongly marked. Periphery of the last whorl well-rounded. Base moderately long, well-rounded, marked like the spire.

Aperture obliquely ovate; posterior angle obtuse; outer lip thin; inner lip very obliquely retractively slanting, somewhat flexuose and provided with a strong fold at its insertion; parietal wall covered by a thin callus. Length, 7.2; diameter, 3.5 mm. (Bartsch.)

TYPE in United States National Museum, No. 334491. Type locality, near San Juan Island, Puget Sound.

RANGE. Gulf of Georgia.

Odostomia satura Carpenter, 1865

Annals and Magazine of Natural History, series 3, **15**:29. *Bulletin 68,* United States National Museum; Pl. 27, fig. 1.

O. testa magna, alba, laevi, solidiore, satis elevata; anfr. nucl. ii., angustis, subplanorboideis, valde decliviter sitis, dextrorsum immersis, sinistrosum extantibus; norm. v., tumidioribus, regulariter convexis, suturis impressis; basi rotundata, tumente, quasi umbilicata; apertura ovata; labro vix sinuato; labio tenui, appresso; plica columellari valida, subantica, parieti haud contigua, transversa. Long., .26; long. spir., .14; lat., .13 poll. (Carpenter.)

Shell of moderate size, broadly conic, white. Nuclear whorls at least two, forming a depressed spire, the axis of which is almost at right angles to the axis of the later whorls, and which is deeply, somewhat obliquely immersed in the first post-nuclear turn. Post-nuclear whorls moderately well-rounded, faintly shouldered at the summit, marked all over by irregular, rough, low, tumescenses, which simulate obsolete vertical ribs. Sutures simple, well-marked. Periphery of the last whorl well-rounded. Base quite short, decidedly rounded, and umbilicated. Umbilicus partly covered by the revolute columella. Aperture large, very broadly oval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thick; columella moderately strong, oblique, decidedly curved, with a decided oblique fold, situated considerably anterior to its insertion; parietal wall covered by a fairly thick callus. (Bartsch.)

TYPE in United States National Museum, No. 15520. Type locality, Neah Bay, Washington.

RANGE. Known only from type locality.

Odostomia sillana Dall and Bartsch, 1909

Plate 64, fig. 9

Bulletin 68, United States National Museum, 222; Pl. 28, fig. 9.

Shell short, conic, yellowish-white. (Nuclear whorls eroded.) Post-nuclear whorls well-rounded, slightly overhanging. Summits appressed, marked by almost vertical lines of growth and numerous, closely spaced, wavy, microscopic, spiral striations. Suture well-marked. Periphery of the last whorl well-rounded. Base rather short, inflated, narrowly umbilicated and marked like the spire. Aperture broadly ovate, somewhat effuse anteriorly. Posterior angle acute; outer lip thin, strongly curved in the middle; columella slender, strongly curved and reflected anteriorly, provided with a weak fold near its insertion; parietal wall glazed by a thin callus. Length, 5.6; diameter, 2.8 mm. (Dall and Bartsch.)

TYPE in United States National Museum, No. 168809. Type locality, west of Amaknak Island, Unalaska.

RANGE. Captain's Bay, Unalaska.

Odostomia subglobosa Bartsch, 1912

Proceedings of the United States National Museum, 42:286; Pl. 37, fig. 2.

Shell moderately large, subglobose, milk-white, very narrowly umbilicated. Nuclear whorls small, deeply, obliquely immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, narrowly, tabulately shouldered at the summit; surface somewhat rough, marked by weak lines of growth and spiral striations; periphery of the last whorl strongly inflated; base short, inflated, marked like the spire. Aperture large, pear-shaped; posterior angle obtuse; outer lip thin at the edge, thick within; inner lip short, strong, twisted, and somewhat revolute, provided with a strong fold a little anterior to its insertion; parietal wall glazed with a moderately thick callus. Length, 6; diameter, 4.1 mm. (Bartsch.)

TYPE in United States National Museum, No. 211560. Type locality, San Diego, California.

RANGE. Known only from type locality.

Odostomia subturrita Dall and Bartsch, 1909

Plate 64, fig. 4

Bulletin 68, United States National Museum, 228; Pl. 28, fig. 4.

Shell ovate, light-yellow. Nuclear whorls small, deeply obliquely immersed on the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened, scarcely at all contracted at the sutures, with a very broad tabulate summit, crossed by numerous spiral striations, which are a little darker-colored than the general surface of the shell. Periphery and base of the last whorl somewhat inflated, well-rounded, marked like the spire between the sutures.

Aperture large, oblong-ovate, slightly effuse anteriorly; posterior angle very obtuse; outer lip thick within, thin at the edge; columella curved, somewhat twisted, strongly reflected, provided with a strong fold a little anterior to its insertion. Length, 6.9; diameter, 3.5 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 168801. Type locality, San Pedro, California.

Range. Santa Barbara, California, to Todos Santos Bay, Lower California.

Odostomia talpa Dall and Bartsch, 1909

Bulletin 68, United States National Museum, 222; Pl. 27, fig. 9.

Shell stout, rough, very broadly conic, narrowly umbilicated. Nuclear small, deeply obliquely immersed in the first post-nuclear turn. Post-nuclear whorls with quite strong concavely shouldered summits, the rest well-rounded (usually showing decided erosion marks, which coincide largely with the lines of growth). The parts bearing the original surface show traces of exceedingly fine spiral striations. Periphery and base of the last whorl rather inflated, well-rounded, the latter narrowly umbilicated, marked like the spire. Aperture broadly oval, posterior angle obtuse; outer lip rather thick, columella stout, thick, somewhat flexuous and reflected, provided with a strong fold a little anterior to the umbilicus; parietal wall covered by a thin callus. Length, 8; diameter, 3.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 204027. Type locality, Mole Harbor, Alaska.

Range. Mole Harbor and Sitka Harbor, Alaska.

Odostomia washingtonia Bartsch, 1920

Journal of the Washington Academy of Sciences, 10:571.

Shell moderately large, broadly elongate-conic, pale horn-colored. Nuclear whorls too eroded to permit of description. Post-nuclear whorls strongly tabulatedly shouldered at the summit, moderately rounded, marked by decidedly retractively slanting lines of growth and numerous very finely incised spiral striations. Sutures conspicuously marked by the tabulated summit. Periphery of the last whorl inflated, strongly rounded. Base short, inflated, and strongly rounded, marked like the spire. Aperture rather large, almost subquadrate, slightly oblique; posterior angle obtuse; outer lip flexuose, reflected over the base, but not appressed, the axis being decidedly protractively slanting. A strong columellar fold is present at the umbilical chink. Parietal wall covered by a thick callus. Length, 8.7; diameter, 4.2 mm. (Bartsch.)

Type in United States National Museum, No. 334490. Type locality, San Juan Island, Puget Sound.

Range. Known only from type locality.

Subgenus HEIDA Dall and Bartsch, 1904

Odostomia kelseyi Bartsch, 1912

Proceedings of the United States National Museum, **42**:288; Pl. 38, figs. 6, 6*a*.

Shell small, ovate, bluish-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, narrowly shouldered at the summit, marked only by moderately retractive lines of growth and numerous exceedingly fine, spiral striations. Sutures subchanneled. Periphery of the last whorl somewhat inflated, well-rounded. Base moderately long, sloping evenly from the periphery to the anterior extremity, the area about the umbilicus having a pinched-in effect, and is surrounded by a somewhat tumid area. Aperture large, broadly oval, somewhat flaring at the anterior lateral angle; posterior angle acute; outer lip thin; inner lip decidedly curved and slightly revolute; parietal wall covered with a thick callus, which joins the callus of the columella to the posterior angle of the aperture, rendering the peritreme complete. No fold is visible on the columella. Operculum horny, thin, paucispiral, concavo-convex, the convex side being the outer. Length, 2.7; diameter, 1.5 mm. (Bartsch.)

Type in United States National Museum, No. 211544. Type locality, San Diego, California.

Range. Known only from type locality.

Subgenus ODOSTOMIA s.s.

Odostomia coronadoënsis Dall and Bartsch, 1909

Plate 65, fig. 3

Bulletin 68, United States National Museum, 233; Pl. 30, fig. 3.

Shell minute, ovate, vitreous. Nuclear whorls almost vertically deeply immersed in the first of the succeeding turns, above which the tilted edge of the last volution projects. Post-nuclear whorls well-rounded, slightly contracted at the sutures, with a well-rounded shoulder at the summit, marked by retractive lines of growth only. Suture well-impressed. Periphery and base of the last whorl slightly inflated, well-rounded, marked like the spire. Aperture ovate; posterior angle acute; outer lip thin; columella slender, strongly curved, slightly revolute, re-enforced by the base, provided with a weak, deep-seated fold; parietal wall covered with a thin callus. Length, 1.7; diameter, 0.8 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206939. Type locality, off Coronado Beach, San Diego, California, in 35 fathoms.

Range. Known only from type locality.

Odostomia dinella Dall and Bartsch, 1909

Plate 65, fig. 1

Bulletin 68, United States National Museum, 232; Pl. 30, fig. 1.

Shell small, ovate, vitreous, semitransparent. (Nuclear whorls decollated.) Post-nuclear whorls forming a spire with almost straight sides, slightly rounded, feebly contracted at the suture, appressed at the summit, marked only by lines of growth. Suture well-impressed. Periphery of the last whorl obscurely angulated. Base somewhat inflated, well-rounded, narrowly umbilicated, marked like the spire. Aperture ovate, posterior angle acute; outer lip thin; columella slender, almost vertical, slightly revolute, provided with a weak fold at its insertion; parietal wall covered with a strong callus. Length, 2.2; diameter, 1.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206938. Type locality, off Redondo, California.

Range. Known only from type locality.

Odostomia farella Dall and Bartsch, 1909

Plate 65, fig. 4

Bulletin 68, United States National Museum, 232; Pl. 30, fig. 4.

Shell small, white. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, slightly rounded at the appressed summit, strongly contracted at the suture, where they are decidedly overhanging. Periphery angulated. Base well-rounded, narrowly umbilicated. Entire surface of spire and base marked by fine lines of growth only. Aperture ovate, posterior angle acute; outer lip thin; columella very obliquely posteriorly, decidedly curved anteriorly, strongly reflected, provided with a weak fold somewhat anterior to its insertion; parietal wall covered with a thin callus. Length, 2.5; diameter, 1.2 mm. (Dall and Bartsch.)

Type in United States National Museum, No. 206937. Type locality, off Long Beach, California.

Range. Known only from type locality.

Odostomia orcutti Bartsch, 1917

Plate 67, fig. 8

Proceedings of the United States National Museum, 52:667; Pl. 46, fig. 8.

Shell minute, pupoid, pale-brown, marked by retractively slanting, incremental lines only. Nuclear whorls deeply immersed in the first of the succeeding turns. Post-nuclear whorls slightly rounded and appressed at the summit, the summit of the last one dropping some little distance below the periphery of the preceding whorl gives to the penultimate whorl an overhanging aspect. Suture moderately impressed. Periphery of the last whorl slightly inflated. Base moderately long, strongly rounded, with a narrow umbilical chink. Aperture oval; outer lip thin; inner lip slightly curved, strongly reflected, and provided with a very strong, oblique fold a little anterior to its insertion; parietal wall covered with a moderately thin callus. Length, 1.5; diameter, 0.8 mm. (Bartsch.)

Type in United States National Museum, No. 274006. Type locality, foot of Broadway, San Diego, California.

Range. Known only from type locality.

Family PTEROTRACHEIDAE

Genus **CARDIAPODA** Orbigny, 1836

Shell minute, cartilaginous; peristome expanded and bilobed in front, enveloping the spire behind. (Tryon, *Structural and Systematic Conchology.*)

Type. *Cardiapoda placenta* Lesson.

Distribution. Atlantic, and North Pacific.

Cardiapoda placenta Lesson, 1830

Voyage de la "Coquille," Zoologie, 253; Pl. 3, figs. 2g, 2n.

Cette petite firole, longue au plus de 2 pounces, est remarquable par diverses particularités de formes qui l'isolent de toutes les espèces connues. La tête est renflée, conique, terminée en avant par une bouche large et arrondie, et séparée du corps par un léger étranglement. Les yeux sont triangulaires, rapproches, très-noirs, portés sur deux renflements du corps en devant. La nageoire dorsale est haute, à bord convexe, mince. Le corps se termine en une sorte de queue cylindrique, sans séparation marquée d'avec le tronc. A sa base un appendice cylindrique, allongé, diminuant graduellement de grosseur, se termine par un nucléus discoïde, élargi, peu épais, coloré en noir mat et bordé par les branchies qui l'entourent en une sorte de couronne. Ces branchies sont coniques, colorées en rose vif, pressées les unes contre les autres, libres à leur sommet, et comme formées de petits fragments soudés et articulés. Le support du nucléus est donc aussi long que l'appendice caudiforme, et ce dernier n'a ni nageoire à sa pointe, ni chapelet à sa suite. La bouche de cette firole aboutit a un sac assez large vivement peint en rose, qui se rétréct en un petit canal, qui se dilate et se renfle au milieu du corps, puis diminue de volume en aboutissant au centre du nucléus. Ce mollusque est blanc hyalin, fragile, d'aspect tuberculeux légèrement teint çà et là de rose, principalement sur le rebord de la nageoire dorsale et sur les lignes les plus saillantes du corps. Le nucléus en dedans est souvent bleuâtre et parfois d'un noir intense. Le cœur nous parait logé dans un renflement placé sous les yeux, et se fait reconnaitre à ses mouvements régulieres de pulsation. (Lesson.)

TYPE in Museum, Paris. Type locality, North Pacific.

RANGE. North Pacific and North Atlantic.

Family CARINARIIDAE

Genus **CARINARIA** Lamarck, 1801

Shell hyaline, symmetrical, limpet-shaped, with a posterior subspiral apex and a fimbriated dorsal keel; nucleus minute, dextrally spiral. (Woodward, *Manual of the Mollusca.*)

TYPE. *Carinaria cymbium* Deshayes.

DISTRIBUTION. Mediterranean, and warmer parts of the Atlantic and Indian oceans and North and South Pacific; Pelagic. Fossil, Miocene. Turin.

Carinaria latidens Dall, 1919

Proceedings of the United States National Museum, **56**:342.

Animal slender and mostly translucent yellowish; the extreme tail for a short distance, the muzzle, and the liver, contained chiefly in the shell, are dark purple; the crop or anterior food cavity is pinkish; the eyes very vivid black, contained in short subcylindric processes behind and a little outside of the short slender tentacles. The surface of the body is covered with small translucent acute pustules. The gills are small and protrude from the shell. The ventral fin is rounded quadrate, about one-third of the way from the muzzle to the tail. The shell and its included organs are about midway of the total length. The ventral sucker is small on the ventral and near the posterior edge of the fin. The dorsal fin halfway between the shell and the tail is lower, rounded triangular, diminishing in height backward. The shell is small, with a minutely coiled apex, and the weight of the included organs causes the animal to swim permanently on its back. The radula is of the general type of that of *C. cristata,* but the rhachidian tooth is more than twice as wide proportionately and develops a small cusp at each anterior corner of the base—a feature not known in *C. cristata.* There are three slender laterals. Behind the eyes the body is gradually constricted, forming a sort of neck. The specimen (which was figured from life) was about 150 mm. in length; its greatest diameter just behind the ventral fin, about 22 mm. (Dall.)

Collected on the surface of the North Pacific Ocean in latitude 43°10′ N. and longitude 147° W. by W. H. Dall, July 23, 1866.

Type in United States National Museum. Type locality, North Pacific, latitude 43°10′ N., longitude 147° W.

Range. Known only from type locality.

Carinaria punctata Orbigny, 1836

Voyage en Amerique Méridioniale, **5**: 160; Pl. 11, figs. 6–15.

Carinaria corpore elongato, punctato, parte cephalica ter contracta; tentaculis conicis, curtis; ala flabelliformi, reticulata; cauda longa, comprimata, acuta; testa tenui, hyalina, sulcata, compressa; apice obliquo, anfractibus ternis; carina undulata, apertura elongata. (Orbigny.)

Pour bien décrire cette partie, nous allons la prendre dans son jeune âge c'est-a-dire au sortir de Pœuf. Alors elle a la forme d'une petite Helice a spire arrondienon carénée, contournée à droite, munie du troit tours completes, en dessus et en dessous d'un large ombilic; mais, dès wue l'animal prend sou accroissement, cette coquille, qui se contournait obliquement, commence à s'élargir tout a coup; (fig. 14–15) et à s'enrouler sur elle-même, de manière a représenter, dans son âge adulte (fig. 11–13) une petite nacelle ou un capuchon fortement comprimé, muni de sillons transversaux, larges et profonds, représentés sur la large carène extérieure par des ondulations profundes, dues à la jonction des seux parois de la coquille, qui laissent une alternance de sillon fort remarquable. Sa bouche est allongée, aiguë en avant; sa contexture, alors, est si mince qu'elle représente le cristal le plus transparent. La couleur de l'animal est peu variée; sa teinte générale est coleur d'eau transparente. Cette translucidite permet d'aperçevoir la trompe, qui est rose violet, et qui se continue en donnant naissance à l'estomac, tout en conservant cette même teine, qui colore aussi l'interieur du nucléus. Sa taille est de 90 a 100 mm. de longueur totale. La coquille a 16 mm. de longueur, sur 3 mm. de largeur. (Orbigny.)

Type in Museum, Paris. Type locality unknown.

Range. North and South Pacific. Pelagic.

Family ATLANTIDAE

Genus **ATLANTA** Lesueur, 1817

Corps renfermé dans une coquille diaphane, spirale et carénée; yeux grands, supportés chacun par un tentacule en forme de cuiller; une trompe; deux nageoires en forme d'ailes. (Lesueur.)

Shell minute, glassy, compressed, and prominently keeled; nucleus dextrally spiral; aperture narrow, deeply notched at the keel; operculum ovate, pointed, lamellar, with a minute, apical, dextrally spiral nucleus. (Woodward, *Manual of the Mollusca.*)

TYPE. *Atlanta peronii* Lesson.

DISTRIBUTION. Warmer parts of the Atlantic, Canary Islands, and North Pacific. Fossil: Tertiary—San Domingo.

Atlanta peronii Lesueur, 1817

Journal de physique, **85**: 390; Pl. 2, figs. 1, 2.

La spire séparée par une carène. Cette espèce a sa spire séparée par la carène jusqu'au centre; l'ouverture est échancrée en avant, et la nageoire gauche est pourvue d'une petite cupule sur son bord postérieur. Le corps contracte rentre entièrement dans la coquille, au fond de laqu elle est le foie, d'une couleur jaune foncée (fig. 1, 2, lett. *a*). Le cœur dont on distingue les pulsations, est place en *b;* l'estomac en *c,* communique avec le foie par un canal très-apparent; *d* est une membrane granuleuse et transparente, qui enveloppe la cavité ou flottent les intestins et l'estomac. En *f* on voit un point blanc, ou ganglion nerveux à la base de chaque pédoncule ses yeux *g;* ceux-ci sont oblongs, oviformes, très-brillians, diaphanes, enveloppés d'une large bande noire divisée en avant, dont il est assez difficile de deviner l'usage. Quand l'animal est étendu, ses dens ailes natatoires développées et la trompe allongée, on aperçoit dans l'échancrure antérieure de la coquille, deux organes; l'un, cylindrique, étranglé à son extrémité et terminé par une petite rosette; l'autre, plus étroit et vermiforme, qui est plus allongé. Le premier est peut-être la termination du canal intestinal, et en effet, il semble se rattacher an canal qui, de l'extrémité de la trompe, va à l'estomac, et le second peut appartenir à l'appareil de la genération. La trompe, que est placée a la base des yeux et des nageoires, est longue, cylindrique, très-mobile, et se développe à son extrémité comme dans les Firoles. (Lesueur.)

TYPE in Museum, Paris. Type locality, North Pacific.

RANGE. North Pacific.

Atlanta involuta Gray, 1850

Figures of Molluscous Animals, 4:101. *Voyage . . . la Bonite,* Atlas, Pl. 21, figs. 9–14.

Atlanta, testa vitrea, discoidea, late carinata, tenuissima, pellucida; spira minima, exsertiuscula, conica, postice inflexa; anfractibus senis, convexis; apertura ovato-acuta, postice reflexiuscula, antice emarginata; peristomate acute, postice interrupto. (Gray.)

Atlanta with vitreous shell, discoidal, broadly carinate, very thin, pellucid; spire very small, slightly projecting, conical inflexed in the rear; with six convex whorls. Aperture ovate-acute, somewhat reflexed in the rear, emarginate in front; peristome acute, interrupted in the rear. (Translation.)

TYPE locality, Pacific Ocean.

RANGE. Pacific Ocean. Pelagic.

Atlanta depressa Gray, 1850

Figures of Molluscous Animals, 4:101. *Voyage . . . la Bonite,* Atlas, Pl. 20, figs. 31–37.

Atlanta, testa vitrea, subovato-discoidea, late carinata, tenuissima, pellucida; spira minima, exserta, conica; anfractibus senis, depressiusculis; ultimo carinato apertura ovato-subacuta, postice reflexiuscula, antice emarginata; peristomate sinuoso et acuto. (Gray.)

Atlanta with vitreous shell, subovate-discoidal, broadly carinate, very thin, pellucid; very small spire projecting, conical; with six slightly depressed whorls; the last one carinate; aperture ovate-subacute slightly reflexed in the rear, emarginate in front; peristome sinuous and acute. (Translation.)

TYPE locality, Pacific Ocean.

RANGE. Pacific Ocean. Pelagic.

Atlanta inclinata Gray, 1850

Figures of Molluscous Animals, 4:101. *Voyage . . . la Bonite,* Atlas, Pl. 21, figs. 9–14.

Atlanta, testa vitrea, discoidea, late carinata, tenuissima, pellucida; spira minima exserta, conica, postice inclinata; anfractibus octonis, convexius culitis, postice coarctatis; ultimo et penultimo carina conjunctis; apertura ovata-acuta, postice reflexuiscula, antice attenuata et profunde fissa; peristomate tenui, acuto. (Gray.)

Atlanta with vitreous shell, discoidal, broadly carinate, very thin, pellucid; very small spire projecting conical, inclined to the rear, with eight whorls slightly convex, constricted in the rear; with the last and next to the last joined by a carina; aperture ovate-acute, reflexed to the rear, attenuate in front, and profoundly divided, peristome thin, acute. (Translation.)

Atlanta guadichaudii Gray, 1850

Figures of Molluscous Animals, 4:101; Pl. 241, fig. 4.

Atlanta, testa vitrea, ovato-discoidea, carinata, tenuissima, pellucida; spira minima, planulata; anfractibus quinis, convexo-depressis, ultimo carinato; carina basi roseo marginata; apertura ovato-subacuta, antice emarginata; peristomate tenui, acuto. (Gray.)

Atlanta with vitreous shell, ovate-discoidal, carinate, very thin, pellucid: spire small, conical, slightly projecting; five whorls, somewhat depressed; the last whorl provided with a carina; aperture ovate-acute, emarginate in front; with acute peristome, slightly reflexed, laterally roundly projecting. (Translation.)

Range. Pacific Ocean. Pelagic.

Atlanta cunicula Gould, 1852

Mollusca and Shells of the United States Exploring Expedition, 492; Pl. 51, fig. 598.

T. fragilissima pellucida, nautiloidea, sub-circularis, compressa, carina latissima cincta; apertura elliptica, acutangularis. (Gould.)

Shell very delicate, with a keel nearly as broad as the shell itself, nearly circular, compressed, quite simple, merely exhibiting very faint lines of growth. (Gould.)

Type in United States National Museum. Type locality, latitude 28° N., longitude 178° E., to the westward of the Sandwich Islands.

Range. North Pacific. Pelagic.

Atlanta helicinoidea Gray, 1850

Figures of Molluscous Animals, 4:101. *Voyage . . . la Bonite,* Atlas, Pl. 120, figs. 23–30.

Atlanta, testa vitrea, discoida, late carinata, pellucida, tenuissima; spira minima, exserta, conica; anfractibus septenis, convexo-depressis; ultimo carinato; carina basi ferrugineo marginata; apertura ovato-acuta, antice emarginata; peristomate tenui, acuto. (Gray.)

Atlanta with vitreous shell, discoidal, broadly carinate, pellucid, very thin; with very small spire, projecting, conical; with seven convex-depressed whorls; the last one carinate, the carina bordered with a rusty-brown base; aperture ovate-acute, emarginate in front; peristome thin, acute. (Translation.)

Type locality, Pacific Ocean.

Range. Pacific Ocean. Pelagic.

Atlanta quoyii Gray, 1850

Figures of Molluscous Animals, 4:101. *Voyage . . . la Bonite,* Atlas, Pl. 20, figs. 16–22.

Atlanta testa vitrea, ovato-discoidea, carinata, tenuissima, pellucida; spira minima, conica, exsertiuscula; anfractibus quinis, depressiusculis; ultimo carina instructo; apertura ovato-acuta, antice emarginata; peristomate acuto, reflexiusculo, lateriter rotoundatim productiusculo. (Gray.)

Atlanta with a vitreous shell, ovate-discoidal, crenate; very thin pellucid, with very small spire, conical, very slightly projecting; with five whorls slightly depressed; the last one provided with a carina; aperture ovate-acute, emarginate in front; peristome acute, somewhat reflexed, on the sides roundly very slightly produced. (Translation.)

Range. Pacific Ocean. Pelagic.

Genus **OXYGYRUS** Benson, 1835

Shell milky, narrowly umbilicated on both sides; nucleus not visible; back rounded, keeled only near the aperture; body whorl, near the aperture and keel cartilaginous; no apertural slit; operculum trigonal, lamellar.

Type. *Oxygyrus keraudrenii* Rang.

Distribution. Atlantic, Pacific, and Mediterranean.

Oxygyrus rangi Lovèn, 1847

Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar, 491; Pl. 44. *Voyage . . . la Bonite,* Atlas; Pl. 18, figs. 18–20.

Atlanta, testa vitreo-membranacea, sub-orbiculari, symmetrica, involuta, utrinque umbilicata, late carinata, tenuissima, translucida; anfractibus ternis, convexis, levigatis, in utroque umbilico perspicuis, tenuissime striatis; ultimo supra carina lata instructo, subtus non carinato; apertura magna, cordiformi, antice canaliculata; peristome sinuoso et acuto, postice interrupto. Operculum vitreum, subtriangulate, tenue, pellucidum, striatum. (Gray.)

Described as *Atlanta.*

Atlanta with vitreous-membranous shell, suborbicular, symmetric, involute, umbilicate on both sides, broadly carinate, very thin, translucent; with three convex whorls extended, perspicuous in each umbilicus, most finely striated; with the last whorl provided with a broad carina above, not carinate below. Aperture large, cardiform, canaliculate in front; with peristome sinuous and acute, interrupted in the rear. Operculum vitreous, subtriangular, thin, pellucid, striate. (Translation.)

Range. Pacific Ocean, off Monterey, California. Pelagic.

Family OVULIDAE

Genus **SIMNIA** (Leach) Risso, 1826 (Ovula)

The genus *Simnia,* is characterized by its sharp outer lip, and is still retained by authors, although as shown under favorable circumstances it sometimes completes its shell by the addition of a thickened lip, when the distinction from the typical group disappears. Ordinarily *Simnia* has the sharp lip and it may be considered a case of arrested growth, paralleled by that of *Planorbis trivolvis*—which only in northern waters takes on its expanded lip along with more vigorous growth and larger size. (Tryon, *Manual of Conchology.*)

Distribution. Tropical and subtropical. Fossil, Tertiary.

Simnia vidleri Sowerby, 1881

Plate 32, figs. 8, 8*a*

Proceedings, Zoölogical Society of London, 638; Pl. 56, fig. 1.

Testa elongata, utrinque acuminata, transversim striata, cerasina, terminibus vivide aurantiacis, dorso medio gibbosiuscula, lavissime angulato, laevigato vel obsolete costato; apertura angusta, antivelavior; labrum laeve, antice subangulatum; columella callosa, potice conspicue uniplicata. Long., 21; diameter, 7 mm. (Sowerby.)

An *Ovulum* of an elongated form, of a cherry-red colour, with bright orange extremities. The back is nearly smooth; and the ends are transversely striated. Several of the specimens brought by Mr. Vidler are smaller, smoother, and more slender than the one I have chosen as type.

Type in British Museum. Type locality, Monterey, California.

Range. Monterey to San Diego, California.

Described as *Ovulum vidleri.*

Simnia acicularis Lamarck, 1811

Paris Muséum d'histoire naturelle, *Annales,* **16**: 112. *Mon. Cabinet List. Conch.,* t. 711, f. 66?

O. Linaeris, perangusta, cæreulescens; extremitibus subacutis; labro vix marginato. (Lamarck.)

Habite l'ocean américain. Espèce petite, mais fort remarquable, rapportée par Mauger, de son voyage aux Antilles. Elle paroit très-distincte des deux suivantes, dont elle se rapproche par ses rapports. Cette coquille ressemble à un grain d'avoine allongè et peu renfle. Elle est subcylindrique grêle, d'un cendre bleuâtre, et s'offre qu'un sinus leger et oblique sur sa columelle. Sa longueur est de 15 mm. L'individu figuré dana Lister étoit probablement moins grêle que ceus que je possède. (Lamarck.)

Yellowish to purplish, thin, smooth, narrow, extremities rather bluntly produced, lip thinly margined, with a callous margin on the columella. (Tryon, *Manual of Conchology.*)

TYPE in Lamarck Cabinet. Type locality, West Indies?

RANGE. San Pedro to San Diego, California, Acapulco, Mexico, Atlantic.

Simnia variabilis C. B. Adams, 1850

Catalogue of Shells Collected at Panama, 31. Tryon, *Manual of Conchology,* 7: Pl. 5, fig. 44.

Shell very slender; usually white, with a slight tinge of rufus, with the lip opaque white; sometimes of a rich red purple; smooth; aperture not very narrow, a little widened anteriorly, moderately produced, effuse, and slightly inflected posteriorly; obliquely emarginate anteriorly; lip well thickened; columella with a longitudinal keel, acute and obliquely produced anteriorly, posteriorly somewhat biplicate. Length, .54; breadth, .15 in. (C. B. Adams.)

TYPE in Amherst Museum. Type locality, San Juan, Lower California.

RANGE. Monterey, California, to Panama.

Subgenus NEOSIMNIA Fischer, 1884

Simnia catalinensis Berry, 1916

Nautilus 30:21; Pl. 5, fig. 3.

Shell very thin, fusiform, swollen above the middle; maximum diameter contained about 2½ times in the length; color a nearly pure porcelain or pearly white, the extreme ends tinted with brownish yellow for a distance of 2 to 3 mm. Surface polished and glossy; closely and finely longitudinally striate, the striae readily visible to the eye and rather irregular, a few being somewhat coarser than the remainder. Spiral sculpture comprising some 20–25 low cords at each end, becoming minutely wavy as they are intersected by the longitudinal striae; indications of an extremely faint wavy spiral striation over the rest of the shell are discovered by a strong lens. Shell pointed at both ends, but distinctly more produced at the apex than at the base. Outer lip not greatly thickened, bordered by a narrow white callus; retracted at both ends, in each instance with an obscure angle. Columella sinuous; a low spiral fold and channel at the summit obliquely encircling the axis. Length, 23; maximum diameter, 8½ mm. (Berry.)

TYPE in Berry Collection, No. 1224. Type locality, off Avalon, Catalina Island, California, in 50 fathoms.

RANGE. Monterey, California, to Gulf of California.

Simnia barbarensis Dall, 1892

See Part III, Plate 98, fig. 4

Proceedings of the United States National Museum, **15**: 206; Pl. 21, fig. 1.

(*O. deflexa* is a southern form but was reported by Col. Jewett from Santa Barbara. His specimen was probably the same as the form here figured, which is of a whitish color and does not seem to agree perfectly with Sowerby's figures. I therefore separate it varietally until more is known. If it prove distinct from *deflexa* the varietal name may take specific rank.) (Dall.)

In comparing the shell of *S. deflexa* with *S. barbarensis* there are many differences. *S. deflexa* is longer and narrower in proportion; columella swollen, excavately flattened, with a line of callus at the outer edge which is not on *S. barbarensis.*

S. barbarensis is much wider in the center, and the columella is smooth and rounded, extremities straight and sharp pointed; aperture wider and outer lip straighter. (Oldroyd.)

Type in United States National Museum. Type locality, San Pedro, California.

Range. Santa Barbara to Gulf of California.

Described as *Ovula (Simnia) deflexa barbarense.*

In this species the color of its shell changes to correspond with that of the *gorgonea* on which it feeds, either yellowish white or purple. (Tryon, *Manual of Conchology.*)

Simnia uniplicata Sowerby, 1848

Proceedings, Zoölogical Society of London, 135.

Ovul. testa elongata, subcylindrica, pellucida, minutissime striata, aurantia, seu violacea, antice subacuminata, postice subrotundata; dorso margine distincto; apertura subaperti; labio externo paululum incrassato, ad extremitates recedente, antice subangulato, ad canalem emarginato; labro interno intus subdepresso, postice spiraliter uniplicato, ad canalem, versus labium externum deflecto, antice subtortuo acuminato. (Sowerby.)

Yellowish white to purplish, rather thin, transversely very minutely incised, or smooth, polished; narrow, with the extremities bluntly produced; lip narrow margined; posterior plication prominent. Length, 15–18 mm. (Tryon, *Manual of Conchology.*)

Type in Zoölogical Society Museum, London? Type locality, near Charleston, South Carolina.

Range. San Pedro, California, to Magdalena Bay, Lower California; also West Indies, North Carolina, and Brazil.

Family CYPRAEIDAE

Genus **CYPRAEA** Linnaeus, 1758

Shell ventricose, convolute, covered with shining enamel; spire concealed; aperture long and narrow, with a short canal at each end; inner lip crenulated. (Woodward, *Manual of the Mollusca.*)

TYPES. *Cypraea tigris* Linnaeus, and *Cypraea mauritiana* Linnaeus.

DISTRIBUTION. In all warm seas (except east coast South America?) but most abundant in those of the old world, on reefs and under rocks at low water.

Cypraea spadicea Swainson, 1823

Philosophical Magazine, **61**: 376. Tryon, *Manual of Conchology,* **7**: Pl. 22, figs. 13, 14.

C. testa ovata, oblonga, immaculata; dorso rufo; ventre albo; lateribus lividus.

Shell ovate-oblong, unspotted; the back reddish chestnut; belly white; sides livid. (Swainson.)

TYPE in Museum Dubois. Type locality, California.

RANGE. Santa Barbara to San Diego, California. Ecuador?

Family TRIVIIDAE

Genus **TRIVIA** Gray, 1832

Small shells with striae extending over the back, where they are frequently interrupted by an impressed dorsal sulcus. (Tryon, *Structural and Systematic Conchology.*)

TYPE. *Trivia europaea* Montague.

DISTRIBUTION. Greenland, Britain, West Indies, Cape, Australia, Pacific, Western America.

Trivia radians Lamarck, 1810

Paris Musée d'histoire naturelle, *Annales,* **15**: 102. Tryon, *Manual of Conchology,* **7**: Pl. 22, figs. 13, 14.

Shell suborbiculata, pallide rubella; lateribus dilatatis depressis; striis transversis subradiatis; sulco dorsali; ventre plano, striato. (Lamarck.)

Rotundly ovate, sides dilated, dorsal impression broad, nodose on each side, the ribs diverging from the nodules, back stained with a dark blotch, base depressed. (Tryon, *Manual of Conchology.*)

TYPE locality, Gulf of California. Type in Lamarck Cabinet.

RANGE. Lower California, Gulf of California to Ecuador.

Described as *Cypraea.*

Trivia californiana Gray, 1828

Zoölogical Journal, **3**:365.

Testa ovata, ventricosa, purpureo-fusca; striis longitudinalibus convexis, distantibus, apice sub-incrassatis; linea dorsali latiuscula, impressa, albida; basi planata, submarginata; apertura lineari; dentibus subequalibus. (Gray.)

Shell ovate, ventricose, purplish brown; the longitudinal striae are distant and convex; their ends are slightly thickened in the middle of the back, where there is a broad, whitish, impressed dorsal line. The base is rather flat, and slightly margined on the outer lip; the aperture is linear; the teeth of the inner lip 11, of the outer 16, nearly similar, small. Length, 4.1; diameter, 3.1 in. (Gray.)

TYPE in British Museum. Type locality, California.

RANGE. Crescent City, California, to West Mexico.

Trivia solandri Gray, 1837

Conchological Illustrations (*Cypraea*), No. 128, fig. 43.

Shell reddish brown, with a light-coloured dorsal groove, and a dark streak along each side of it; ribs prominent, wide apart, tuberculated at their dorsal extremities, mouth rather narrow, teeth of the outer lip more numerous than in *C. radians;* margin generally broad. Length, 0.7; breadth, 0.55 mm. (Gray.)

This species is very much like *radians,* indeed it is impossible to know which of the two, this or the one we commonly call by that name, is the *radians* of Lamarck. The principal difference is in the number of teeth on the inner edge of the outer lip. (Gray.)

TYPE in? Type locality?

RANGE. Catalina Island, California, to Panama.

Described as *Cypraea.*

Trivia ritteri Raymond, 1903

Nautilus, **17**:85.

Shell small, white, form ovate, inflated, anterior extremity slightly produced, spire completely covered, but rather prominent, base convex, outer lip margined, strongly sculptured with about twenty smooth, sharp ribs, much narrower than the interspaces, which are nearly flat and scarcely roughened by irregular rugae parallel to the axis of the shell; no sulcus, the ribs continuing unchanged in width across the back, except that occasionally a few ribs near the spire are interrupted at the median line; a few short intercalary ribs are usually present on the sides of the shell; aperture rather wide, armed with 17 to 18 denticulations on the outer lip, and 14 to 16 on the inner. Length, 11.5; breadth, 8.6; height, 7.2 mm. (Raymond.)

TYPE in University of California. Type locality, 60 fathoms off Catalina Island, California.

RANGE. Monterey to San Pedro, California, to Cortez Bank.

Trivia sanguinea Gray, 1832

Descriptive Catalogue of Recent Shells, Cypraea. Tryon, *Manual of Conchology,* **7**: 203.

Ovate, purple-brown, back stained in the middle with a blood-red spot, whitish at each end, ribs whitish, dorsal impression almost obsolete. Length, .35–.5 inch. (Tryon, *Manual of Conchology.*)

TYPE in Museum Cuming. Type locality, St. Elena, West Colombia.

RANGE. Catalina Island, Magdalena Bay to Salina Cruz, Mexico; Ecuador.

Genus **ERATO** Risso, 1827

Shell obovate, polished; spire short, conical, distinct; aperture linear; outer lip without varix, but thickened towards the middle, and denticulated within; columella with distinct plaits at the fore-part. (Tryon, *Structural and Systematic Conchology.*)

TYPE. *Erato laevis* Donovan.

DISTRIBUTION. Europe, West Indies, South Africa, Indian Ocean, Philippines, Polynesia, tropical western America, California. Fossil, Eocene—Europe, South Australia, North America.

Erato vitellina Hinds, 1844

Zoölogy of the Voyage of H. M. S. Sulphur, Pl. 13, figs. 22, 23.

Testa obeso-ovata, caeruleo-rufescente; spira retusa; labio incrassato, grosse vii-dentato; columella, granulata; apertura inferne dilatata, ad basin effusa. (Hinds.)

This is the largest species hitherto described, but is not otherwise very prominently distinguished. It possesses the peculiar livid color common to most of the species, varying to white near the sutures and at the back of the lip; the latter is of a horny-green color. (Hinds.)

RANGE. Bodega Bay, and Farallon Islands to San Diego, California.

Erato albescens Dall, 1905

Nautilus, **18**:124.

Shell whitish, thin and polished, with four whorls; the spire low and nearly covered with a thin glaze extending from near the aperture; shell bluntly pyriform with a wide mouth, smooth pillar, the outer lip thickened, obscurely marginate externally, with about nine obscure distant denticulations internally; pillar short, twisted, with a flaring edge and almost gyrate axis; the body with a thin wash of callus, but, in the type no sign of pustulation. Longitude of shell, 15.0; of aperture, 13.5; maximum diameter, 10.0 mm. (Dall.)

TYPE in United States National Museum. Type locality, United States Fish Commission Station 4431, California.

RANGE. Off Santa Rosa Island, California, to La Paz, Lower California.

Erato columbella Menke, 1847

Zeitschrift für Malakozoologie, **4**: 183. Tryon, *Manual of Conchology,* **5**: Pl. 5, fig. 48.

E. testa turbinato-ovato, laevi, nitida, dorso ventricoso cinerea, extremitate utraque carneo tincta; spira brevi; labri margine externo incrassato, albido, posterius in angulum producto, interno denticulato, columella basi obsolete triplicata. Long., ?; lat., 2; alt., 1.5 lin. (Menke.)

Shell pyriform, yellowish, stained with livid flesh-color, spire very short, whorls tumidly globose round the upper part, constricted at the lower, lip swollen, somewhat varicose. (Reeve, *Conchologia Iconica.*)

TYPE in? Type locality, Mazatlan, Mexico.

RANGE. Monterey, California, to Panama Bay.

Family PEDICULARIIDAE

Genus **PEDICULARIA** Swainson, 1840

Shell small, limpet-like, irregular, with small, short spire concealed with the growth, and a radiately ribbed surface when young; mouth large, lip simple, irregular. Operculum none. (Tryon, *Structural and Systematic Conchology.*)

TYPE. *Pedicularia sicula* Swainson.

DISTRIBUTION. Europe, Polynesia, California.

Pedicularia californica Newcomb, 1864

Plate 31, fig. 15

Proceedings of the California Academy of Sciences, **3**:121. Also **4**:322; Pl. 1, fig. 9.

P. testa depressa-globosa, coccinea, minutia transversa striata, supra rotundata, infra late aperta; labio expanso, semi-circulare; columella crassa, dilatata, intus recta; apertura elongato sub-ovata; extremitatibus effusis; long., 0.4; lat., 0.3; alt., 0.25 poll. (Newcomb.)

Shell depressly globose, crimson colored, minutely transversely striated, above rounded, below broadly open; lip expanded, semicircular; columella thick, dilated within, straight; aperture elongately subovate; extremities broadly notched. (Newcomb.)

Type in ? Type locality, growing on a monster crustacean of the genus *Echidnocerus,* from deep water at the Farallon Islands.

Range. Farallon Islands to Monterey, California.

Family RANELLIDAE

Genus **BURSA** Bolten, 1798 (Ranella)

Shell ovate or oblong, with two rows of continuous varices, one on each side; aperture oval; columella arcuated and ridged, or crenulated; canal short, recurved; outer lip crenulated. (Tryon, *Structural and Systematic Conchology.*)

Example. *Ranella granifera* Lamarck.

Distribution. Tropical seas, world-wide.

This is the genus *Ranella* Lamarck.

Subgenus Bufonaria Schumacher, 1817

Bursa californica Hinds, 1843

Plate 33, figs. 7, 8

Annals and Magazine of Natural History, **11**:255. *Zoölogy of the Voyage of H. M. S. Sulphur,* Pl. 2, figs. 4, 5.

Testa ovata, ventricosa, fusca; anfractibus uniseriatim tuberculatis, transversim granoso-striatis, tuberculis conicis, subdistantibus; varicibus magnis cavernosis; anfractu ultimo multiseriatim obsolete tuberculato, fasciis duabus angustis purpureis indistinctis cincto; apertura alba; labio externo crenato et dentato, interno transversim striato. Axis 52 lin. (Hinds.)

Shell acuminately ovate, large, rather solid, ventricose, varices very strongly tubercled; whorls angulated, armed with rather distant large solid tubercles, transversely striated, slightly granulated, obsoletely wrinkled next the suture; whitish, variegated with yellowish chestnut and encircled with distant, narrow, interrupted, chestnut bands; columella faintly wrinkled; canal very short, rather broad; aperture large, interior white; lip crenulated, deeply sinuated at the upper part. (Reeve, *Conchologia Iconica.*)

Type in Museum Cuming. Type locality, San Diego, California.

Range. Monterey, California, to Cerros Island, Lower California.

Family CYMATIIDAE

Genus **ARGOBUCCINUM** March, 1852

Stout, dull-colored shells with dense periostracum, spiral sculpture, few and inconspicuous, irregularly placed varices, and a short canal. (Dall.)

Type. *Ranella vexillum* Broderip.

Distribution. Bering Sea to San Diego, California, to Chile.

Subgenus Fusitriton Cossmann, 1903

Argobuccinum oregonensis Redfield, 1848

Plate 37, figs. 1, 2, 3

Annals of the Lyceum of Natural History of New York, **4**:165; Pl. 11, fig. 2, *a*, *b*.

Testa fusiform, elongata, tenui, albida, epidermide hirsuta fusca induta; anfractibus rotundatis; plicis longitudinalibus, costis et sulcis transversis valde decussatis; varicibus exilibus; apertura ovata, canalicula, alba.

Shell fusiform, elongate; thin, whitish, covered with a rough hairy, brown epidermis; the whorls are rounded, with from 18 to 25 longitudinal folds which are cancellated by transverse ribs and furrows. There are four or five of these ribs on each of the upper whorls, and each rib is divided by a slight furrow, while the intervening hollows are in like manner divided by a slight ridge. The last whorl has from 10 to 15 transverse ribs, and their bifid character is not so conspicuous as upon the upper whorls. The varices are about 12 in number, not prominent, and are crossed by the ribs already mentioned. Aperture ovate, elongate, extending downward into an open canal; the exterior ribs and folds plainly visible within. When mature the right lip is slightly thickened into a varix. The columella shows upon its upper part the transverse ridges of the shell; the lower portion is smooth and somewhat twisted; a slight umbilical trace is seen where the pillar lip is applied to the base of the shell. Length, 4.25; breadth, 2 in. (Redfield.)

Type in cabinet of Dr. B. W. Budd, Cabinet of Naval Lyceum, Brooklyn, New York. Type locality, Straits of Juan de Fuca. I am indebted to Dr. Budd for the opportunity of describing this curious shell. In form it resembles the *Fusus antiquus* (Lin.) Lam. It is very nearly allied to *T. cancellatum* Lam. and to *T. scabrum* King, but is readily distinguished from the former by the absence of the elevated tooth or ridge which is found upon the upper portion of the columella in that species, while from *T. scabrum* it is distinguished by its greater size, its elongation, the rounded character of its whorls, its longer canal, and its more prominent cancellation. Its varices also, though not very prominent, are more so than in either of the species just mentioned. (Redfield.)

Described as *Triton.*

Genus **CYMATIUM** Bolten, 1798 (Triton)

Whorls triangular; aperture longer than the spire; outer lip dentated internally. Operculum with apical nucleus. (Tryon, *Manual of Conchology.*)

Type. *Triton tigrinus* Broderip.

Distribution. West Indies, Red Sea, Indian Ocean, Philippines, Central Polynesia, Madagascar, west coast Central America, Japan, California.

Cymatium corrugatum tremperi Dall, 1907

Nautilus, 21:85.

Shell agreeing closely with *C. corrugatum* except in the following particulars: the periostracum in the latter is light-colored, velvety, with the processes or hairs of a uniformly even length; in *tremperi* it is blackish-brown, coarse, lamellose, with, on the varices, strong, sparse, projecting hairs reaching 6 millimeters in length. In all specimens I have examined of the Mediterranean shell, there are, between the revolving primary ribs, numerous small subequal minor threads; while in *tremperi* there are in the channels only one or two coarse, irregular, markedly larger ribs. The other differences are all apparently of an individual character. Length, 85; aperture, including the canal, 36; max. diameter, 38 mm. (Dall.)

Type in United States National Museum. Type locality, off San Pedro, California.

Range. San Pedro, California, to Gulf of California.

Cymatium gibbosum Broderip, 1833

Proceedings, Zoölogical Society of London, 7. Reeve, *Conchologia Iconica,* (*Triton*), Pl. 13, fig. 38.

Trit. sub-fusiformi, subfulva vel subfusca, subnodulosa, transversim creberrime lineata; anfractibus subtrigonis; apertura subrotunda, alba, labri expansi radiati margine interna dentato. Long., 1½; lat., 11/12 poll. (Broderip.)

Shell somewhat triangularly fusiform, with four varices; spire elongately turreted, sutures deep, irregular; whorls triangularly gibbous, encircled with very close, raised striae, obsoletely ridged, ridges faintly noduled or warty; brown or yellowish brown; canal rather short; aperture small, round, interior white; lip radiately flatly expanded, denticulated within. (Reeve, *Conchologia Iconica.*)

Type in British Museum. Type locality, Panama.

Range. San Pedro and San Diego, California, to Panama.

Described as *Triton gibbosus*.

Family SEGUENZIIDAE

Genus **SEGUENZIA** Jeffreys, 1876

Shell globular or conical, glossy, without epidermis, exquisitely sculptured; upper part of the last whorl deeply and widely grooved; pillar abruptly notched below, and exhibiting a small tooth-like process; base either deeply umbilicated or imperforate.

Differs from the other genera by having a broad sutural slit, instead of on the periphery. Operculum very thin, paucispiral. (Tryon, *Structural and Systematic Conchology.*)

Type. *Seguenzia formosa* Jeffreys.

Distribution. Azores, West Indies, Pernambuco, California.

Seguenzia caliana Dall, 1919

Plate 33, figs. 4, 5, 6

Proceedings of the United States National Museum, **56**:344.

Shell small, white, elevated, trochiform, with a minute, glassy, smooth nucleus, and about five subsequent whorls; suture obscure, laid on the peripheral keel; spiral sculpture of, on the spire, a single sharp prominent keel somewhat behind the central line between the sutures, and, on the last whorl, a similar peripheral keel with a wide excavated space on each side of it, the space behind the periphery wider; base with seven, rather close-set, squarish cords, those nearer the axis most adjacent to each other; axial sculpture of low, thin, sharp lamellae with wider interspaces overriding the peripheral keel on the spire but not on the last whorl, prominent in the interspaces behind the base, retractively arcuate in the posterior interspace, and protractively arcuate in the others; they do not invade the somewhat flattish base; aperture with a very deep sulcus next the suture, the outer lip in front of it much produced; a feeble sulcus at the middle of the base; in front of the arcuate pillar a smaller rounded dentation; behind the pillar a deep groove ending in a minutely perforate umbilicus; body with no perceptible glaze. Height of shell, 4.5; diameter, 3.2 mm. (Dall.)

Type in United States National Museum, No. 207694. Type locality, U. S. Fish Commission Station 2928, off San Diego, California, in 417 fathoms.

Range. Off La Jolla and San Diego, California.

Seguenzia cervola Dall, 1919

Proceedings of the United States National Museum, **56**:344.

Shell small, white, slightly depressed, with one small, smooth nuclear whorl and five subsequent whorls flattened a little in front of a distinct suture, separated by a somewhat convex, smooth fasciole from a thread-like keel above the periphery; in front of this is a wide, smooth interval; on the base are about a dozen spiral threads with wider interspaces, and very faint microscopic spiral striae are visible in all the interspaces under a lens; on the upper whorls there is a small thread between the keel and the suture, and near the apex they become obsolete; at the aperture is a shallow sulcus between the keel and the suture and a smaller one at the middle of the base; there is a sharp notch below the end of the thin, arcuate projecting pillar, behind which is a moderately large twisted umbilicus; the body shows no glaze; the base of the shell is conspicuously convex. Height, 4.5; diameter, 5 mm. (Dall.)

TYPE in United States National Museum, No. 209229. Type locality, U.S. Fish Commission Station 4381, off North Coronado Island, in 618 to 692 fathoms.

RANGE. Known only from type locality.

Seguenzia giovia Dall, 1919

Plate 33, figs. 1, 2, 3

Proceedings of the United States National Museum, **56**:343.

Shell resembling the preceding species, but larger and differently sculptured; nucleus minute, smooth, subglobular followed by seven sculptured whorls; suture obscure, laid on the peripheral keel; spiral sculpture of four narrow prominent keels, of which the second is peripheral, the third marginates the base, and the fourth is on the base, the interspaces much wider and becoming narrower anteriorly; there are also seven closer even low threads on the base with subequal interspaces; the posterior wide interspaces are sculptured with close-set, fine, spiral threads; axial sculpture of numerous equal and equally spaced arcuate threads, with wide interspaces, which on the upper whorls bead the posterior carina, but later are chiefly visible in the interspaces and extend over the whole shell; the sulcus at the aperture next the body is shallow, the outer lip beyond it moderately produced and crenulate by the sculpture; the thin and arcuate pillar has a very small notch at its base; and there is a deep twisted perforate umbilicus and a thin layer of enamel on the body. Height, 6; diameter, 5 mm. (Dall.)

TYPE in United States National Museum, No. 209228. Type locality, U.S. Fish Commission Station 4408, off Catalina Island, California.

RANGE. Known only from type locality.

Seguenzia certoma Dall, 1919

Proceedings of the United States National Museum, **56**:343.

Shell small, trochiform, white, with a minute, smooth globular nucleus and seven subsequent strongly sculptured whorls; suture obscure; spiral sculpture of a small, closely beaded thread at the summit of the whorl, separated from a low, sharp carina by a wider, excavated interspace, and the latter from a more prominent peripheral carina by a still wider space; on the base are three sharp threads followed by three lower rounded threads, which approach the pillar; axial sculpture of fine, even, arcuate wrinkles, which, except where they bead the posterior thread, are chiefly visible in the interspaces; the suture is laid on the peripheral thread, and between it and the outer lip at the aperture is a very deep sulcus; the outer lip is much produced and its edge is modified by the external sculpture, so that there is a sulcus at the end of the peripheral keel, another at the middle of the base, and still another at the base of the pillar, which is arcuate and produced like a small plait; the base is imperforate, the body with no visible glaze. Height, 5; diameter, 3.5 mm. (Dall.)

Type in United States National Museum, No. 211167. Type locality, U.S. Fish Commission Station 4337, off Point Loma, California, in 565 to 680 fathoms.

Range. Known only from type locality.

Family TRIFORIDAE

Genus **TRIFORA** (Deshayes) Blainville, 1828 (Triphonis)

Shell turreted, sinistral; aperture round, produced anteriorly into a closed, tubular canal, sometimes with a posterior, closed canal. (H. & A. Adams.)

Type. *Trifora perversa* Linnaeus.

Distribution. Straits of Malacca, Australia, New Guinea, New Ireland, West Indies, Mediterranean, Pacific and Atlantic coasts of America. Fossil, Eocene, Norway, Australia; Pleistocene, San Pedro.

Trifora peninsularis Bartsch, 1907

Plate 71, fig. 2

Proceedings of the United States National Museum, 33:255; Pl. 16, fig. 2.

Shell sinistral, small, broadly elongate, conic, dark brown. Nuclear whorls four, light brown, increasing regularly in size, provided with spiral and axial sculpture (but this is too badly worn to be properly diagnosed in all our specimens). Post-nuclear whorls eight, separated by channeled sutures. The first four post-nuclear whorls have a double spiral row of tubercles, the posterior row being a little more strongly developed than the anterior. These rows are separated by a channel about as wide as the tubercular ridges. Beginning with the fifth whorl, a slender tuberculate cord appears in the middle of the channel which separates the two spiral ridges; this grows steadily in size with each turn, until on the last volution it is quite as strong as the suprasutural cord. On the later turns the middle and suprasutural spiral cords and their tubercles fall off quite abruptly at their posterior border and slope roundly toward their anterior limit. The tubercles on all the turns are joined by rather wide spiral bars and axial ribs, which inclose deep squarish pits between them. Periphery and base of the last turn well-rounded, the former marked by a low, somewhat flattened keel, which is separated from the supraperipheral cord by a channel as wide as the one which separates the supraperipheral keel from the middle one. The channel is crossed by the extension of the axial riblets. The base is marked by two spiral cords about as broad and of the same character as the peripheral one. These cords are separated by channels as broad as that which separates the peripheral cord from the supraperipheral one and are crossed by feeble extensions of the axial riblets. The anterior basal cord is situated upon the base of columella and its anterior border fuses almost imperceptibly with it. The entire surface is crossed by many exceedingly fine spiral striations and lines of growth. Aperture subquadrate, posterior angle obtuse, anteriorly strongly channeled; outer lip subpatulous anteriorly, not sinuous; columella short, thick twisted. Columella and the parietal wall are covered with a strongly developed callus. Length, 4; diameter, 1.5 mm.; but the type has lost three of its nuclear whorls. (Bartsch.)

Type in United States National Museum, No. 106424. Type locality, Point Abreojos, Lower California.

Range. San Diego, California, to Point Abreojos, Lower California.

Trifora catalinensis Bartsch, 1907

Plate 71, fig. 18

Proceedings of the United States National Museum, 33:253; Pl. 16, fig. 18.

Shell sinistral, elongate-conic, rather stout, with the posterior half of the exposed portion of the whorls white and the anterior half light brown. (Part of the nuclear whorls decollated.) The three and one-half remaining turns of the nucleus increase regularly in size and are marked by about twenty-six slender axial riblets on the first, and thirty-two on the next and on the third whorls. In addition to these riblets the nuclear whorls are encircled by two prominent sublamellar slender, finely tuberculate spiral keels, which are placed about equally distant from the sutures and are a little nearer to each other than to the sutures. The anterior one of these keels is much more strongly developed on the last nuclear turn than the posterior member. The intersections of the spiral keels and axial riblets are tuberculate. The whorls have a strong sloping shoulder which extends from the posterior keel to the summit. Post-nuclear whorls separated by strongly marked sutures, ornamented by two spiral rows of nodules, of which the posterior one is the stronger. These two rows of nodules are separated on the first seven post-nuclear whorls by a spiral channel almost as wide as the suture. From the seventh post-nuclear whorl on, a slender, spiral, weakly tuberculate cord makes its appearance in the channel, growing stronger with each succeeding turn. This cord is situated a little nearer the posterior row of tubercles than the anterior, and like the posterior row of tubercles is white. The tubercles are connected by blunt, ill-defined, axial riblets. There are about twenty tubercles on the first and fifth post-nuclear whorls and twenty-four upon the penultimate turn. In addition to the strong sculpture just defined, the entire surface, tubercles and depressions, are crossed by many fine lines of growth and spiral striations. Periphery of the last whorl marked by a slender, weakly tuberculate keel. Base exceedingly short, almost flat, crossed by strong lines of growth and fine spiral striations, marked by a brown band at the insertion of the columella. Aperture subquadrate, outer lip sinuous, conforming with the external sculpture, basal wall slightly concave; columella very stout, short, and strongly twisted. Basal channel well developed. Length, 5.3; diameter, 2.2 mm. (Bartsch.)

TYPE in United States National Museum, No. 193998. Type locality, Catalina Island, California.

RANGE. Catalina Island to Laguna Beach, California.

Trifora stearnsi Bartsch, 1907

Plate 71, fig. 3

Proceedings of the United States National Museum, 33:254; Pl. 16, fig. 3.

Shell elongate-conic, sinistral, flesh colored. (Early whorls decollated.) The nine remaining are moderately high, marked by a double spiral row of very strong, equally developed, rounded tubercles, which are separated on the first three turns by a channel as deep and well-marked as the sutures. This space between the two rows of tubercles gradually develops into a slender tuberculate keel, which on the last turn is about half as wide as the tubercular ridges. There are about eighteen tubercles on the third to the seventh of the remaining whorls and twenty on the penultimate. Periphery angulated. Base short, marked by two strong spiral keels. (Aperture fractured.) Length, 4.1; diameter, 1.4 mm. (Bartsch.)

Type in United States National Museum, No. 32259. Type locality, Gulf of California.

Range. San Diego, California, to Gulf of California.

Trifora carpenteri Bartsch, 1903

Plate 71, fig. 16

Proceedings of the United States National Museum, 33:252; Pl. 16, fig. 16.

Shell elongate-conic, almost cylindric, bleached white. (Early whorls decollated.) Later turns ornamented by three spiral ridges, of which the posterior one is a little more strongly developed than the other two and forms the summit of the whorls. The other two spiral ridges are equal and equally spaced. In addition to the spiral ridges, the whorls are marked by axial ribs, about as strong as the spiral ridges, the intersection of the ribs and ridges forming strong tubercles, while the spaces inclosed between them appear as deeply impressed square pits. There appear to be about twenty-two tubercles upon all the whorls. The sutures appear as broad, deep channels which are crossed by the extensions of the ribs. On the last three turns the posterior edge of the peripheral keel is apparent in the suture. In addition to the above sculpture, the entire surface of the spire is marked with microscopic lines of growth and equally fine striations. Periphery of the last turn marked by a strong spiral keel. Base marked by two strong rounded keels, of which the posterior one is separated about as far from the peripheral keel as that is separated from the supra-peripheral one. The anterior keel of the base is situated on the columella and is separated by a little wider and deeper channel from the posterior keel than that is from its posterior neighbor; anteriorly it is limited by a feebly impressed groove. The channels of the base are crossed by weak continuations of the axial riblets. Aperture ovate, strongly channeled anteriorly and moderately so posteriorly; columella short, stout, and twisted; covered by a strong callus which also extends over the parietal wall. Length, 7.2; diameter, 2.2 mm. (Bartsch.)

Type in United States National Museum, No. 15583. Type locality, Neah Bay, Washington.

Range. Known only from type locality.

Trifora callipyrga Bartsch, 1907

Plate 71, fig. 4

Proceedings of the United States National Museum, 33:251; Pl. 16, fig. 4.

Shell elongate, conic, subturreted, uniformly light brown. (Early whorls decollated.) The remaining seven are separated by strongly impressed sutures, and are ornamented with three spiral tuberculate keels on the spire. The middle one of these keels is decidedly stronger than the rest and marks the widest part of the turns, while the anterior one is the least developed on all the early turns. On the last whorl the three are subequal. In addition to the spiral keels the spire is marked by slender, axial riblets, of which there are about eighteen upon the first of the remaining and twenty upon the penultimate turn, the intersection of the riblets and the spiral keels forming the tubercles. The tubercles slope convexly toward their anterior limit and are somewhat excavated posteriorly. Periphery of the last whorl marked by a sulcus. Base with two equally strong keels on the posterior half, separated from each other by a sulcus as wide as the peripheral one, and a third weak thread on the base of the thick columella. Aperture irregular, the main portion subcircular, strongly channelled posteriorly and anteriorly; outer lip moderately strong, columella short, stout, and decidedly twisted, covered partly by the very strong purplish parietal callus. Length, 5.2; diameter, 2.2 mm. (Bartsch.)

TYPE in United States National Museum, No. 195377. Type locality, San Pedro, California.

RANGE. San Pedro to San Diego, California.

Trifora pedroana Bartsch, 1907

Plate 71, fig. 1

Proceedings of the United States National Museum, **33**:250; Pl. 16, fig. 1.

Shell sinistral, elongate-conic, light brown. Nuclear whorls four, increasing regularly in size. The first three smooth, probably by erosion, the next faintly, obsoletely sculptured by about thirty-six slender, equally strong and equally spaced axial riblets and two slender spiral threads, separated by a narrow channel near the periphery of the whorl. Succeeding turns separated by broad and deep channeled sutures; the first seven ornamented by two equally strong spiral rows of tubercles, which are separated by a channel, as wide as that at the sutures. Beginning with the eighth turn, a slender tuberculate keel makes its appearance in this channel, situated a little nearer the posterior keel than the suprasutural one. This keel increases steadily in size and on the penultimate turn exceeds the supraperipheral one in strength. On the last three turns the tubercles of the posterior keel are a little more strongly developed than on the other keels. On all the keels the tubercles slope a little more abruptly at their posterior border, the anterior edge being gently rounded. There are fifteen tubercles upon the first, seventeen upon the fifth, and twenty-four upon the penultimate post-nuclear turn. The tubercles are connected spirally by a moderately wide band and axially by slender riblets, the spaces inclosed between these connections appearing as rounded pits. The entire surface of the spire is crossed by numerous microscopic spiral lines and lines of growth. Periphery of the last whorl ornamented by a tubercular keel, which is not quite as strong as the supraperipheral keel. Base dark brown, moderately long, marked by two strong spiral keels, the anterior one of which is situated partly upon the columella, while the other one occupies a plane halfway between the anterior and the peripheral keel. The spaces which separate these keels are about equal in width and are crossed by slender continuations of the axial riblets. Columella stout and twisted, marked by slender spiral lirations. Aperture pyriform, strongly channeled anteriorly and posteriorly; outer lip patulous, marked within by a light brown band posteriorly and a narrow dark-brown zone at the base; columella and parietal wall covered with a thick callus. Length, 5.1; diameter, 1.9 mm. (Bartsch.)

TYPE in United States National Museum, No. 152206. Type locality, San Pedro, California.

RANGE. San Pedro, California, to South Coronado Island. Fossil, Upper San Pedro Series, at the lumber yard, San Pedro, California.

Trifora montereyensis Bartsch, 1907

Plate 71, fig. 17

Proceedings of the United States National Museum, 33:249; Pl. 16. fig. 17.

Shell rather stout, brown, with a wax-yellow band about one-third the width of the height of the whorls encircling the middle of the turns. (Nucleus decollated in all the specimens examined.) Post-nuclear whorls separated by strongly channeled sutures, ornamented on the early turns by a double spiral row of tubercles and on the last three by a triple row, the median one of which is very slender on all but the last turn and is situated a little nearer the posterior row than the suprasutural one. There are twenty tubercles upon the second and twenty-six upon the penultimate turn. These tubercles are joined by moderately strong spiral bands and axial riblets which inclose strongly impressed rounded pits between them. The periphery is marked by a keel almost as strong as the supraperipheral one, while the base, which is uniformly dark brown, bears two prominent keels, the anterior one of which is well upon the short, stout columella. The channels between these keels are crossed by the feeble extensions of the axial riblets. Aperture strongly channeled anteriorly and posteriorly; columella and parietal wall covered with a strong callus. The type has the last seven whorls and measures: Length, 4.6; diameter, 2.2 mm. (Bartsch.)

TYPE in United States National Museum, No. 32216. Type locality, Monterey, California.

RANGE. Known only from the type locality.

Family CERITHIOPSIDAE

Genus **CERITHIOPSIS** Forbes and Hanley, 1849

Shell more or less cylindrical and slender, closely tuberculate or beaded, never varicose, nor umbilicate; spire tapering to an abrupt but elongated point; whorls numerous, the earliest very slender in proportion to the rest; suture narrow, excavated; mouth small; canal extremely short, truncated, and straight; operculum horny, ear-shaped, having an incomplete spire; nucleus nearly terminal, at the inner base of the mouth. (Jeffreys, *British Conchology.*)

TYPE. *Cerithiopsis tubercularis* Montagu.

DISTRIBUTION. Europe, Pacific Coast of North and South America.

SECTION CERITHIOPSIS, s.s.

Cerithiopsis oxys Bartsch, 1911

Plate 68, fig. 2

Proceedings of the United States National Museum, **40**:332; Pl. 36, fig. 2.

Shell minute elongate-conic, dark brown. Nuclear whorls almost four, forming a slender, elongate-conic spire, having the whorls well rounded. Post-nuclear whorls, well-rounded, separated by a strongly channeled suture marked by three equally strong, spiral cords, the first of which is at the summit, the third slightly above the periphery, while the second is median between these two. In addition to the spiral cords, the whorls are marked by vertical, axial ribs, almost as strong as the spiral cords. Of these ribs, 16 occur upon the first, 20 upon the second, 18 upon the third to fifth, and 24 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong tubercles of which those of the posterior cord are rounded while the other two are truncated posteriorly and slope gently anteriorly, while the spaces inclosed between the spiral cords and axial ribs are strongly impressed, rounded pits. Periphery of the last whorl marked by a strong cord which is feebly nodulose and separated from the tuberculate keel posterior to it by a channel as wide as those occurring on the spire; this channel is marked by the continuations of the axial ribs. Base moderately long, marked by a strong, spiral cord about halfway between the peripheral cord and the insertion of the columella, the spaces which separate it from the peripheral cord on one side and from the columella on the other, appearing as deep, rounded channels. Aperture rather small, irregularly ovate, very strongly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture; columella very stout, twisted revolute, and reflected; parietal wall glazed with a thin callus. Length, 3.3; diameter, 1.2 mm. (Bartsch.)

Type in United States National Museum, No. 106505. Type locality, Point Abreojos, Lower California.

Range. San Pedro, California, to Point Abreojos, Lower California.

Cerithiopsis carpenteri Bartsch, 1911

Plate 72, fig. 9

Proceedings of the United States National Museum, **40**:334; Pl. 38, fig. 9.

Shell broadly elongate-conic, dark chocolate brown. Nuclear whorls three, smooth, well-rounded, separated by a slender suture, forming an elongate-conic spire. Post-nuclear whorls well-rounded, marked by three strong, broad, spiral bands which are as wide as the spaces that separate them. Of these, the first and widest is at the summit, the next is median, while the third is a little posterior to the suture. In addition to the spiral keels, the whorls are marked by slender, rounded, axial ribs, which are about half as wide as the spiral cords. Of these ribs, 20 occur upon the first and second, 22 upon the third to fifth, 24 upon the sixth and seventh, 28 upon the eighth, and 30 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong, elongated tubercles, having their long axis parallel with the axial sculpture. The tubercles at the summit are well-rounded anteriorly and posteriorly; those of the median series are a little more suddenly rounded anteriorly than posteriorly; while those belonging to the supraperipheral cord are truncated suddenly posteriorly and slope gently anteriorly. The spaces between the spiral cords and axial ribs are small, moderately rounded, well-impressed pits. Suture constricted, showing a portion of the basal cord. Periphery of the last whorl marked by a deep, spiral groove as wide as that separating the first supraperipheral cord from the median spiral cord and, like it, crossed by the continuations of the axial ribs. Base short, well-rounded, marked by a broad, spiral cord which is truncated posteriorly and slopes gently anteriorly toward the shallow, well-marked groove which separates it from the base proper. Entire surface of spire and base marked by numerous, very slender, incremental lines. Aperture irregularly oval, very strongly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered decidedly sinuous at the edge by the external sculpture; columella stout, moderately long, the edge reflected; parietal wall glazed with a thin callus. Length, 8.1; diameter, 2.8 mm. (Bartsch.)

Cotypes in United States National Museum, No. 109510. Type locality, Terminal Island, San Pedro.

Range. San Pedro, California, to South Coronado Island.

Cerithiopsis pedroana Bartsch, 1907

Plate 72, fig. 2

Proceedings of the United States National Museum, **33**:181; **40**: Pl. 38, fig. 2.

Shell small, slender, dark brown. Nuclear whorls three, yellowish-white, smooth. Post-nuclear whorls strongly differentiated from the nuclear ones, showing the sculpture characteristic of the adult shell from the very beginning. This sculpture consists of three equally spaced tuberculate spiral keels between the sutures, the posterior one of which is slightly smaller than the other two. These keels are separated by deep rounded channels almost as wide as the keel. In addition there are many low, rather broad axial ribs, the intersections of which with the keel form the tubercles. About 20 of them occur upon the first, 22 upon the fifth, and 30 upon the penultimate post-nuclear turn. The connection between the tubercles, both spiral and axial, are about equal, inclosing deep, squarish pits. In addition to the above sculpture the entire surface is marked by fine spiral lines and lines of growth. Sutures strongly marked, constricted, showing the peripheral keel in the later whorl. Periphery marked by a broad, low, rounded keel. Another of equal width is located upon the middle of the base. The sulcus which separates these keels, and the supraperipheral sulcus are of equal width; both are crossed by the weak continuations of the axial ribs, which gradually weaken as they pass toward the columella. The basal keel is separated from the columella by broad, shallow grooves. Aperture irregularly oval, decidedly channeled anteriorly, outer lip thin, rendered sinuous by the external keel; columella stout and somewhat twisted, with a strong callus on its inner edge that extends over the parietal wall. Length, 5.2; diameter, 18 mm. (Bartsch.)

Cotypes in United States National Museum, No. 109512. Type locality, Terminal Island, San Pedro, California.

Range. San Pedro, California, to Point Abreojos, Lower California.

Cerithiopsis berryi Bartsch, 1911

Plate 69, fig. 8

Proceedings of the United States National Museum, **40**:339; Pl. 39, fig. 8.

Shell small, elongate-conic, brown. Nuclear whorls four, well-rounded, separated by constricted sutures, smooth, forming a mucronate apex to the shell. Post-nuclear whorls strongly sculptured, having three spiral cords between the sutures, of which the one at the summit is much smaller than the rest of the early whorls; the other two are subequal in strength, the second one being close to the one at the summit, while the third is almost halfway between the second and the suture. On the last whorl, the cord at the summit is almost equal to the other two. In addition to the spiral sculpture, the whorls are marked by vertical axial ribs which are stronger than the spiral cords. Of these ribs, 12 occur upon the second, 16 upon the third to fifth, 18 upon the sixth, and 20 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong tubercles, which are truncated posteriorly and slope gently anteriorly. The spaces inclosed between them are elongated, narrow pits between the first and second spiral cords on the early whorls, while on the last they are squarish pits in this region. The spaces between the median and supraperipheral cords are strongly impressed, large, squarish pits on all the whorls. Sutures strongly channeled. Periphery of the last whorl marked by a broad sulcus, equaling that which separates the supraperipheral from the median cord, crossed by the continuations of the axial ribs. Base marked by a strong, broad, rounded cord immediately below the periphery and a second less strong on its middle, while a slender thread encircles the insertion of the columella. In addition to this sculpture, the base is marked by strong, incremental lines. Aperture irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered sinuous at the edge by the external sculpture; columella stout, curved, strongly twisted, with the edge reflected; parietal wall glazed with a thick callus. The type has lost the nucleus, eight remaining post-nuclear whorls measuring: Length, 3.4; diameter, 1.3 mm. (Bartsch.)

Type in United States National Museum, No. 195182. Type locality, 12 fathoms off Del Monte, Monterey, California.

Range. Monterey Bay, California, to South Coronado Island.

Cerithiopsis cesta Bartsch, 1911

Plate 69, fig. 5

Proceedings of the United States National Museum, **40**:341; Pl. 39, fig. 5.

Shell elongate-conic, chestnut brown. Nuclear whorls three, well-rounded, and smooth, forming a slender elongate spire. Post-nuclear whorls strongly rounded, marked with three feebly tuberculated spiral keels between the sutures of which the posterior is at the summit and the anterior at some little distance posterior to the suture, the median one being a little nearer the anterior than its other neighbor. The spaces between these keels are not quite as wide as the keels. In addition to the spiral keels, the whorls are marked with feeble, somewhat irregular axial riblets which are less than half as strong as the spiral keels; of these ribs, 14 occur upon the third and 32 upon the remaining whorls. These ribs render their junction with the spiral cords feebly nodulose. The spaces inclosed between the spiral cords and the axial ribs are feebly impressed, squarish pits. In addition to the above sculpture, the entire surface of the shell is crossed by fine incremental lines and very fine spiral striations. Sutures strongly impressed, with the peripheral cord showing as a slender, smooth band in all but the first two whorls. Periphery of the last whorl marked by a broad, depressed spiral cord which is separated from the first suprasutural cord of the spire by a sulcus as wide as that separating this cord from its posterior neighbor. This groove is crossed by the continuations of the axial ribs. Base large, moderately rounded, marked with a slender spiral cord which is a little nearer the peripheral cord than the slender fasciole at the insertion of the columella. Aperture irregularly ovate; outer lip thin, rendered sinuous at the edge by the external sculpture showing the internal sculpture within; columella stout, rather long, twisted and curved; parietal wall glazed with a thin callus. Type has lost all but the post-nuclear whorl. Length, 5.8; diameter, 2.1 mm. (Bartsch.)

TYPE in United States National Museum, No. 153057. Type locality, Government Jetty, San Diego.

RANGE. Known only from type locality.

Cerithiopsis stejnegeri Dall, 1884

Plate 70, fig. 3

Proceedings of the United States National Museum, 7:345; Pl. 2, fig. 4.

Shell broadly conic, light chestnut brown, excepting the nucleus and the columella. Nuclear whorls two, strongly rounded, smooth. Post-nuclear whorls well-rounded, marked with three nodulose spiral keels, of which one is at the shouldered summit, another somewhat posterior to the suture, while the third is median between the two. The anterior of the three is the strongest and the one at the summit is the weakest. These cords are about as wide as the spaces that separate them. In addition to the spiral cords the whorls are marked by very poorly developed, almost vertical, axial riblets, the junctions of which with the spiral cords form the nodules. Of these ribs 16 occur upon the second, 18 upon the third, 22 upon the fourth, 24 upon the fifth, and 26 upon the penultimate whorl. The spaces inclosed between the spiral cords and axial ribs are irregular, shallow impressed, rounded pits. Sutures strongly constricted, showing the posterior edge of the base. Periphery of the last whorl marked by a sulcus which is crossed by the feeble axial riblets; base well-rounded, smooth, excepting incremental lines. Aperture broadly ovate; decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered wavy by the external sculpture showing the external sculpture within; columella short, stout, twisted, and curved; parietal wall glazed with a thin callus which extends from the inner edge of the columella to the posterior angle of the aperture. Length, 5.5; diameter, 2.2 mm. (Dall.)

Type in United States National Museum, No. 40932. Type locality, Bering Island.

Range. Commander, Aleutian, and Shumagin Islands, Alaska.

Cerithiopsis stejnegeri dina Bartsch, 1911

Plate 70, fig. 7

Proceedings of the United States National Museum, **40**:343; Pl. 40, fig. 7.

This is the southern representative of *C. stejnegeri,* differing from the species in having the sculpture much more strongly pronounced and in being larger. Length, 7; diameter, 2.6 mm. (Bartsch.)

Type in United States National Museum, No. 195175. Type locality, Sitka, Alaska.

Range. Known only from type locality.

Cerithiopsis grippi Bartsch, 1917

Plate 67, fig. 12

Proceedings of the United States National Museum, **52**:669; Pl. 46, fig. 12.

Shell of medium size, chestnut brown. Nuclear whorls four and one-half, smooth, well-rounded, forming a moderately elevated apex which is transparent. Post-nuclear whorls narrowly shouldered at the summit, moderately rounded in the middle, decidedly contracted from the last spiral cord to the suture, marked by slender, slightly retractive axial ribs, of which 14 occur on the first, 16 upon the second and third, 18 upon the fourth and fifth, and 20 upon the remaining turns. Intercostal spaces about half as wide as the ribs. In addition to this axial sculpture, the whorls are marked by three strong spiral cords, of which the one at the summit is a trifle weaker than the other two. The junction of the axial ribs and the spiral cords form very prominent well-rounded tubercles, of which those on the first and median cords are well-rounded, while those on the third cord are truncated posteriorly and sloped gently anteriorly. The spaces inclosed between the cords and the axial ribs are well-rounded, well-impressed pits. Suture almost channeled. Periphery of the last whorl marked by a broad groove, which is a little wider than the groove between the median and the third cord. The axial ribs extend across this groove, but stop at its anterior limit. Base short, well-rounded, marked by two strong spiral grooves, of which one is on the median part, while the other encircles the insertion of the inner lip. The entire surface of the spire and the base is marked by very fine incremental lines and much finer spiral striations. Aperture of irregular shape, decidedly channeled anteriorly; posterior angle very obtuse; outer lip somewhat effuse, rendered decidedly sinuous at the edge by the external sculpture; columella very strong; inner lip reflected and appressed to the columella. Parietal wall covered by a thin callus. Length, 4.7; diameter, 1.2 mm. (Bartsch.)

Type in United States National Museum, No. 250632. Type locality, off San Diego Bay, California.

Range. Known only from type locality.

Cerithiopsis diomedae Bartsch, 1911

Proceedings of the United States National Museum, **40**:359; Pl. 37, fig. 5.

Shell small, elongate-conic, brown. (Nuclear whorls decollated.) Postnuclear whorls with a strongly channeled suture in which the posterior edge of the peripheral cord is apparent on all the whorls; marked by three spiral cords, of which the first is considerably weaker than the other two and is situated at the summit, rendering this somewhat shouldered; the third is about as far posterior to the suture as it is removed from the median, while the second is halfway between the first and third. The spaces between the spiral cords are equal and about one and one-half times as wide as the cords. In addition to the spiral sculpture, the whorls are marked by well-rounded, slender, protractive, axial ribs which are almost equal to the spiral cords in strength. Of these ribs, 16 occur upon the first, 18 upon the second to fourth, 20 upon the fifth and sixth, and 24 upon the penultimate turn. The junctions of the axial ribs and spiral cords form moderately strong, rounded tubercles, while the spaces inclosed between them are rectangular pits having their long axes parallel with the spiral structure. Periphery of the last whorl marked by strong, spiral cord, which is separated from the supraperipheral cord by a channel as wide as that which separates the supraperipheral cord from the median and, like it, is crossed by the axial ribs which terminate at the posterior edge of the peripheral cord. Base very long, concave, marked by incremental lines and a single, obsolete fasciole a little posterior to the insertion of the columella. Aperture irregularly oval; posterior angle very obtuse; outer lip thin, showing the external sculpture within by transmitted light, rendered sinuous at the edge by the external sculpture; columella long, curved, and twisted, the edge reflected; parietal wall glazed with a thick callus. Length, 4.3; diameter, 1.5 mm. (Bartsch.)

Type in United States National Museum, No. 213302. Type locality, U.S. Bureau of Fisheries, Steamer "Albatross," Station 3566, San Diego Bay, California.

Range. San Diego Bay, California, to Todos Santos Bay, Lower California.

Cerithiopsis paramoea Bartsch, 1911

Plate 72, fig. 4

Proceedings of the United States National Museum, **40**:356; Pl. 38, fig. 4.

Shell moderately large, broadly elongate-conic, brown. (Nuclear whorls decollated.) Post-nuclear whorls appressed at the summit, ornamented with three nodulose, spiral cords which are about as wide as the spaces that separate them. The first of these is at the summit, the third is on the anterior fourth between the sutures, while the second is halfway between the two. In addition to the spiral cords the whorls are marked by axial ribs almost equaling the spiral cords in strength; of these ribs, 16 occur upon the first and second, 18 upon the third, 20 upon the fourth, 22 upon the fifth, and 32 upon the penultimate turn. The junctions of the axial ribs and spiral cords form nodules which on the early whorls are well rounded and on the last elongate, their long axes corresponding with the axial sculpture. The spaces inclosed between them are well-rounded pits. Sutures moderately impressed, showing the posterior edge of the first basal cord. Periphery of the last whorl marked by a sulcus almost as wide as that separating the supraperipheral from the median cord, and, like it, crossed by the continuations of the axial ribs. Base well-rounded, smooth except for the feeble cord immediately below the peripheral sulcus. Aperture irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered somewhat sinuous by the external sculpture; columella short, curved, with the free edge reflected; parietal wall glazed with a thin callus. Length, 6.3; diameter, 2.1 mm. (Bartsch.)

Type in United States National Museum, No. 1582. Type locality, Neah Bay, Washington.

Range. Known only from type locality.

Cerithiopsis bakeri Bartsch, 1917

Plate 67, fig. 10

Proceedings of the United States National Museum, **52**:670; Pl. 46, fig. 10.

Shell of medium size, chestnut brown. Nuclear whorls three and one-half, well-rounded, smooth, forming a styliform apex. Post-nuclear whorls well-rounded, narrowly tabulatedly shouldered at the summit, and decidedly contracted anterior to the third keel, marked by rather slender axial ribs, of which 18 occur upon the first to fourth, 20 upon the fifth, 22 upon the sixth, and 24 upon the last turn. Intercostal spaces about one and one-half times as wide as the ribs. In addition to the axial sculpture the whorls are marked by three strong spiral keels of which the first, which is considerably weaker than the rest, is at the summit. These keels are about as wide as the spaces that separate them and are much stronger than the axial ribs. The junctions of the axial ribs and the spiral keels form tubercles.

The tubercles on the first keel are well-rounded, while those on the second and third are truncated posteriorly and slope gently anteriorly. Periphery of the last whorl marked by a deep spiral groove which is as wide as that separating the median from the third keel. This groove is crossed by the continuations of the axial ribs which stop at the anterior termination of the groove. Suture strongly channeled. Base moderately long, slightly concave, marked by a very strong spiral keel immediately anterior to the peripheral groove. The anterior border of this keel is limited by a slender incised line. A second low, weakly developd spiral cord encircles the middle of the base between the basal fasciole, which is a mere slender thread at the insertion of the columella, and the keel immediately anterior to the periphery. Aperture of irregular shape, decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous at the edge by the strong external sculpture; inner lip decidedly flexuous, reflected over and adnate to the base; parietal wall covered with a moderately thick callus. Length, 4.2; diameter, 1.5 mm. (Bartsch.)

Type in United States National Museum, No. 223049. Type locality, South Coronado Island, Lower California.

Range. Known only from the type locality.

Cerithiopsis charlottensis Bartsch, 1917

Plate 67, figs. 9, 11

Proceedings of the United States National Museum, **52**:668; Pl. 46, figs. 9, 11.

Shell elongate-conic, pale brown. Nuclear whorls strongly rounded, three, forming a slender, very elevated spire, smooth. Post-nuclear whorls well-rounded, appressed at the summit, marked by rather strong, almost vertical, axial ribs of which 14 occur upon the first four turns, 16 upon the fifth, 18 upon the sixth, and 20 upon the penultimate whorl. Intercostal spaces a little wider than the ribs. The spiral sculpture consists of three strong cords, of which the one at the summit is a little less strong than the other two. The junctions of the spiral cords and the axial ribs form strong tubercles; those on the cord at the summit are well-rounded, while those of the median cord are truncated anteriorly and posteriorly. The tubercles of the third cord are truncated posteriorly and sloped gently anteriorly. The spaces inclosed between the spiral cords and the axial ribs are well-rounded pits. Sutures moderately constricted. Periphery of the last whorl marked by a spiral groove, which equals in strength and width the groove that separates the median from the third cord on the spire. Base short, well-rounded, smooth, excepting the exceedingly fine incremental lines and microscopic spiral striations which are also present on the spire, and a very slender basal fasciole which surrounds the insertion of the inner lip. Aperture decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, decidedly sinuous at the edge; inner lip rendered decidedly flexuous; parietal wall covered by a thin callus. Length, 5; diameter, 1.7 mm. (Bartsch.)

Type in United States National Museum, No. 225185. Type locality, U.S. Bureau of Fisheries, Station 4205, in 60 fathoms, Queen Charlotte Sound, British Columbia.

Range. Queen Charlotte Sound, British Columbia, to Puget Sound, Washington.

Cerithiopsis montereyensis Bartsch, 1911

Proceedings of the United States National Museum, **40**:363; Pl. 41, fig. 5.

Shell small, broadly conic, light brown. (Nuclear whorls decollated.) Post-nuclear whorls marked by three spiral cords, the first of which (very poorly developed, in fact almost obsolete on the early whorls) is at the summit, while the next is separated from it by a narrow channel, the third being about as far posterior to the suture as the second is from the first, and the space between the second and third being double the width of that between the first and second. In addition to the spiral cords, the whorls are marked by vertical, axial ribs which are equal to the spiral cords in strength. Of these ribs, 15 occur upon the second and third, 16 upon the fourth and fifth, 18 upon the sixth, and 22 upon the penultimate turn. The junctions of the axial ribs and spiral cords form cusp-like tubercles, while the spaces inclosed between them are very elongate, rectangular pits between the first and second spiral cord, and strongly impressed, squarish pits between the second and third. Suture well-impressed. Periphery of the last whorl marked by a narrow keel which is separated from the supraperipheral keel by a sulcus as wide as that separating the first from the second spiral cord, and crossed by the continuations of the axial ribs which terminate at its posterior border. Base short, slightly rounded, ornamented with three narrow, spiral keels, of which the first two are much stronger than the other. These keels are equally spaced between the periphery and the middle of the base, which is occupied by the last one. In addition to the above sculpture, the entire surface of spire and base is marked by numerous, fine incremental lines. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered strongly wavy by the external sculpture, which is apparent in the aperture; columella short, stout, curved, and decidedly twisted, the free edge reflected; parietal wall glazed with a thin callus. Length, 3.2; diameter, 1.3 mm. (Bartsch.)

Type in United States National Museum, No. 32395. Type locality, Monterey Harbor, California.

Range. Little River, Mendocino County, to Monterey, California.

SECTION CERITHIOPSIDA Bartsch, 1911

Cerithiopsis antemunda Bartsch, 1911

Plate 68, fig. 4

Proceedings of the United States National Museum, **40**:359; Pl. 36, fig. 4.

Shell elongate-conic, brown. (Nuclear whorls decollated.) Post-nuclear whorls appressed at the summit, very slightly rounded, marked by three spiral cords, of which the first—which is at a little distance anterior to the summit—is obsolete on the first four whorls, giving them a decidedly shouldered appearance, while on the last turn it is almost equal to the other two. The second cord is a little posterior to the suture. The spaces between these spiral cords are about double the width of the spiral cords. In addition to the spiral sculpture, the whorls are marked by slender, well-rounded, retractive, axial ribs, equaling the spiral cords in strength. Of these ribs, 14 occur upon the first to fourth, 16 upon the fifth and sixth, and 20 upon the penultimate turn. The junctions of these axial ribs and spiral cords form well-rounded tubercles, while the spaces inclosed between them are strongly impressed, squarish pits. Sutures strongly channeled, showing the posterior edge of the peripheral cord. Periphery of the last whorl marked by a strong, spiral cord, which is separated from the supraperipheral cord by a sulcus as wide as that which separates the supraperipheral from the median cord, and, like it, is crossed by the continuations of the axial ribs which extend to the posterior edge of the peripheral cord. Base concave, with a slender fasciole surrounding the insertion of the columella and marked axially with fine, incremental lines, which also extend over the entire surface of the spire. Aperture subquadrate, strongly channeled anteriorly; posterior angle decidedly obtuse; outer lip thin, showing the external sculpture within, rendered sinuous at the edge by the external sculpture; columella stout, twisted with the edge reflected; parietal wall covered with a thin callus. Length, of the eight remaining whorls, 5; diameter, 1.9 mm. (Bartsch.)

Type in United States National Museum, No. 213313. Type locality, U.S. Bureau of Fisheries, Station 2932, off San Diego, California.

Range. San Pedro to San Diego, California.

Cerithiopsis diegensis Bartsch, 1911

Plate 70, fig. 4

Proceedings of the United States National Museum, **40**:347; Pl. 40, fig. 4.

Shell small, broadly elongate-conic, chestnut brown. Nuclear whorls two and one-half; the first smooth; the next turn has about 20 slender axial threads; while the last whorl has about 32 axial threads and two spiral cords, the first of which is on the middle of the whorl, and the second one about halfway between this and the suture. The early post-nuclear whorls have two spiral cords, like the last of the nuclear whorls. Beginning with the third turn, a slender, spiral cord appears immediately anterior to the summit, increasing rapidly in size until, on the last volution, it is about equal to the other two. In addition to the spiral sculpture, the whorls are marked by strong, axial ribs equaling the spiral cords in strength. Of these ribs, 16 occur upon all but the penultimate turn, which has 18. The junctions of the axial ribs and spiral cords form prominent, cusp-like tubercles, while the spaces inclosed between them form large, squarish pits. Suture strongly impressed. Periphery of the last whorl marked by a strong keel, separated from the supraperipheral cord by a sulcus as wide as that which separates the supraperipheral from the median cord and, like it, crossed by the continuations of the axial ribs which terminate at the posterior border of the peripheral cord. Base short, concave, bearing a slender fasciole at the insertion of the columella. Entire surface of spire and base crossed by numerous fine, incremental lines. Aperture subquadrate, very strongly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture, which is apparent in the aperture; columella short, and broad, twisted, the free edge reflected; parietal wall glazed with a thin callus. Length, 4; diameter, 1.6 mm. (Bartsch.)

TYPE in United States National Museum, No. 160079. Type locality, San Diego, California.

RANGE. San Pedro to San Clemente Island, California, to South Coronado Island.

Cerithiopsis gloriosa Bartsch, 1911

Plate 68, fig. 7

Proceedings of the United States National Museum, **40**:353; Pl. 36, fig. 7.

Shell elongate-conic, flesh-colored, variegated with flecks of brown; the early whorls are light brown, while the base is dark chestnut. (Nuclear whorls decollated. Post-nuclear whorls marked by three strong sublamellar keels, which are not quite as wide as the spaces that separate them. The first of these is near to the appressed summit, the third quite a bit anterior to the suture, while the second occupies the space midway between these two. In addition to these keels, the whorls are marked by slightly protractive, axial ribs which are equal to the spiral cords in strength. Of these ribs, 16 occur upon the first to fifth, 18 upon the sixth, 20 upon the seventh, 22 upon the eighth, 24 upon the ninth, and 26 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong, cusp-like tubercles, which are suddenly truncated posteriorly and slope gently anteriorly; the spaces between them are deep, squarish pits. Sutures moderately constricted, showing the peripheral cord on all the turns. Periphery of the last whorl marked by a very strong spiral keel, the space between which and the first supraperipheral keel is almost as wide as that separating the supraperipheral keel from the median, and, like that, is crossed by the continuations of the axial ribs which extend prominently to the posterior termination of the peripheral keel. Base marked by a slender, basal fasciole which surrounds the insertion of the columella, the space between the fasciole and the peripheral cord being concave. Aperture irregularly oval, very strongly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered decidedly sinuous at the edge by the external sculpture; columella short and stout, the edge reflected; parietal wall glazed with a thin callus. Length, 8.6; diameter, 2.4 mm. (Bartsch.)

Type in United States National Museum, No. 213301. Type locality, California.

Range. Off San Diego, California.

Cerithiopsis rowelli Bartsch, 1911

Plate 70, fig. 6

Proceedings of the United States National Museum, **40**:348; Pl. 40, fig. 6.

Shell elongate-ovate, pale brownish yellow. Nuclear whorls large and tumid extending considerably beyond the lateral outline of the first post-nuclear whorl; the first half volution, smooth, well-rounded; the remaining one and a half decidedly inflated, strongly rounded, crossed by very strong acute axial ribs which are about one-third as wide as the strongly impressed intercostal spaces that separate them. Of these ribs, about 17 are on the last turn. Post-nuclear whorls slopingly shouldered below the appressed summit marked by three tuberculate, spiral keels, which divide the spaces between the sutures into four equal rows. In addition to the spiral keels, the whorls are marked by strong, broad, axial ribs the intersection of which with the spiral keels appear as prominent cusps. Of these ribs, 16 occur upon the first and second, 18 upon the third, 20 upon the fourth and penultimate turn. The individual tubercles of all three keels are truncated posteriorly and slope gently and regularly to the anterior border. The spaces inclosed by the axial ribs and spiral keels are well-impressed, squarish pits. Suture strongly constricted, periphery of the last whorl marked by a prominent, smooth keel; base short, almost flat, smooth, excepting lines of growth and a slender fasciole about the base of the columella. Aperture irregularly ovate; decidedly channeled anteriorly; posterior angle acute; outer lip rendered decidedly sinuous by the external sculpture; columella very broad at base, somewhat twisted and sinuous, the anterior edge slightly reflected; parietal wall glazed with a thin callus. Length, 4.5; diameter, 1.8 mm. (Bartsch.)

Type in United States National Museum, No. 15559. Type locality, California?

Range. California.

SECTION CERITHIOPSIDELLA Bartsch, 1911

Cerithiopsis cosmia Bartsch, 1907

Plate 72, fig. 7

Proceedings of the United States National Museum, **33**:180. Also **40**: Pl. 38, fig. 7.

Shell elongate-conic, variegated with various shades of brown, white, and wax yellow. Nuclear whorls three and one-half, slender, lending the apex a mucronate appearance. First nuclear whorl smooth, second crossed by feeble axial riblets. The riblets increase considerably in size in the remaining turns, where they are very regularly developed and evenly spaced. They are strongly protractive as they pass from suture to suture, the extremity at the lower suture being considerably in advance of the extremity at the summit. In addition to the vertical riblets, microscopic crinkly lines appear on the intercostal spaces, which intersect the riblets in oblique even curves at right angles. The transition from the nuclear to the post-nuclear sculpture is abrupt, the three chief tuberculate spiral keels being present from the very beginning of the post-nuclear turn. On the first four post-nuclear turns the posterior spiral keel is less developed than the rest, but it increases with each succeeding turn and finally becomes the strongest of the three. The tubercles are the early whorls, are almost round, and slope abruptly, concavely posteriorly and gently well-rounded anteriorly. On the later whorls they are oblong, with their long axis vertical. Channels separating the spiral keels about as wide as the keels on the early whorls, less so in the later turns, curved by the low, broad, strong, backward slanting axial riblets. The spaces between these ribs and the spiral keels appear as rounded pits. Sutures well-impressed. Periphery of the last whorl marked by a strong spiral keel. Base well-rounded, marked by three equal and equally spaced spiral keels separated by equally wide and strong channels. The entire surface of the spire and base keels, tubercles, and channels are marked by microscopic lines of growth and spiral striations.

Aperture subquadrate, posterior angle obtuse, decidedly channeled at the junction of the short, thick, somewhat twisted columella and outer lip. This description is based upon two specimens: one has the nucleus and 11 post-nuclear whorls, and the other has furnished the description of the nucleus. Length of this, 7.3; diameter, 2.3 mm. (Bartsch.)

Cotypes in United States National Museum, No. 195196. Type locality, Whites Point, San Pedro.

Range. Monterey, California, to San Bartolome Bay, Lower California.

Cerithiopsis antefilosa Bartsch, 1911

Plate 70, fig. 9

Proceedings of the United States National Museum, 40:349; Pl. 40, fig. 9.

Shell elongate-conic, light chestnut brown. Nuclear whorls three and one-half, moderately rounded, separated by a poorly defined suture; the first one smooth, the next two and one-half with slender, closely-spaced, axial threads, and fine, spiral lirations in the intercostal spaces. Post-nuclear whorls slightly rounded, marked by three tuberculate spiral cords of which the posterior one is at the summit, the anterior at some little distance posterior to the suture, while the third is about median between the two. The posterior cord is very poorly developed on the early whorls, in fact quite absent on the first volution, but grows steadily in size until in the last volution it is as strong as the other two. In addition to the spiral cords, the whorls are marked by vertical axial ribs which are as strong as the spiral cords and render the junction with them tuberculate. Of these ribs, 14 occur upon the first to third, 16 upon the fourth, 18 upon the fifth and sixth, 20 upon the seventh to ninth, 22 upon the tenth, and 24 upon the penultimate turn. The tubercles of the posterior cord are well-rounded, that of the median slightly truncated posteriorly, while on the anterior cord they appear truncated in the middle, sloping gently anteriorly and very suddenly posteriorly. Sutures strongly constricted; periphery of the last whorl marked by a sulcus, which is as wide as the spaces that separate the keels on the spire, and, like them, is crossed with the continuations of the axial ribs. Base short, well-rounded, marked by four spiral keels, which grow gradually weaker and a little closer spaced from the periphery to the umbilical area, the last one forming a slender basal fasciole about the insertion of the columella. In addition to the spiral sculpture, the base is marked by numerous fine incremental lines. Aperture rhomboidal; decidedly channeled anteriorly; posterior angle acute; outer lip thin, rendered wavy by the external sculpture; columella moderately long, stout, decidedly curved, and somewhat twisted. The type has lost the first two nuclear whorls, the thirteen remaining whorls measuring: Length, 6.9; diameter, 1.8 mm. (Bartsch.)

Type in United States National Museum, No. 195200. Type locality, eight miles off Point Loma Light, California, U. S. Bureau of Fisheries, Station 4310.

Range. San Pedro to San Diego, California.

Cerithiopsis alcima Bartsch, 1911

Plate 69, fig. 2

Proceedings of the United States National Museum, **40**:350; Pl. 39, fig. 2.

Shell elongate-conic, chestnut brown. Nuclear whorls three and one-half, small, moderately rounded, separated by a well-impressed suture; the first whorl smooth; the second and third marked by slender, protractive, curved, axial ribs, of which 18 occur upon the second and 20 upon the third. Intercostal spaces about twice as wide as the axial ribs, crossed by about 15 slender, spiral lirations. Post-nuclear whorls moderately rounded, appressed at the summit, ornamented with three spiral cords, of which the first is at the summit, which on the first five whorls is scarcely apparent; beginning with the sixth turn, it increases in size until on the last volution it almost equals the other two. The third cord is about as far posterior to the suture as it is from the second cord, which is halfway between the first and third. The spiral cords are not quite as wide as the spaces that separate them. In addition to the spiral cords, the whorls are marked by low, almost vertical, axial ribs, which are less strong than the spiral cords and render their intersections with these cuspidate. Of the axial ribs, 16 occur upon the second to fourth, 18 upon the fifth and sixth, 20 upon the seventh, 22 upon the eighth, and 24 upon the ninth and penultimate turn. The tubercles formed by the junction of the first cord and the axial ribs are well-rounded; those formed by the junction of the median cord and the ribs are truncated anteriorly and posteriorly, sloping a little more gently anteriorly than posteriorly; those formed by the junction of the third cord and the ribs are decidedly truncated posteriorly, sloping gently anteriorly. The spaces inclosed between the axial ribs and the spiral cords are strongly impressed squarish pits. Suture well-marked, showing the posterior edge of the peripheral cord. Periphery of the last whorl marked by a strong cord, separated from the supraperipheral cord by a sulcus almost as wide as that which separated the supraperipheral cord from the median, and like it, crossed by the continuations of the axial ribs which terminate at the posterior border of the peripheral cord. Base rather short, concave, marked by two, strong, spiral cords and a slender fasciole, the latter surrounding the columella at its insertion, while the former divides the space between it and the peripheral cord into equal areas. In addition to the above sculpture, the entire base and spire are marked by numerous slender, incremental lines. Aperture irregularly subquadrate, strongly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous at the edge by the external sculpture, which is apparent in the aperture; columella short, stout, twisted, with the free edge reflected; parietal wall glazed with a thin callus. Length, 7.2; diameter, 1.2 mm. (Bartsch.)

TYPE in United States National Museum, No. 195198. Type locality, Whites Point, San Pedro, California.

RANGE. San Pedro, California, to South Coronado Island.

Cerithiopsis onealensis Bartsch, 1921

Proceedings of the Biological Society of Washington, **34**:35.

Shell elongate-conic, pale chestnut brown. Nuclear whorls decollated. Post-nuclear whorls moderately rounded, slightly overhanging, crossed by very strong, broad, rounded, slightly protractively slanting axial ribs, of which 16 occur upon the first four turns, 18 upon the fifth, and 26 upon the last. Intercostal spaces about half as wide as the ribs. In addition to the axial ribs the whorls are crossed by three strong spiral cords, of which the one at the summit is a little less strong than the other two. The junction of the axial ribs and spiral cords forms very prominent tubercles. Those on the cord near the summit are well-rounded. Those on the median cord are truncated posteriorly, and almost truncated anteriorly, while those on the cord above the suture are abruptly truncated posteriorly and slope moderately gently anteriorly. On the last whorl, where the ribs are much more crowded, the tubercles have an oblong outline, and are about equal on all three cords, their long axis coinciding with the axis of the shell. The pits inclosed by the spiral cords and axial ribs are well-rounded on all the whorls. Suture strongly impressed. Periphery of the last whorl marked by a sulcus about as broad as that separating the median from the supersutural cord on the spire. Base short, well-rounded, marked by feeble continuation of the axial ribs, which lend it a roughened aspect, and a single slender spiral thread, which encircles the base at the insertion of the columella. Aperture decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, sinuous at the edge; inner lip sigmoid, reflected over and appressed to the columella. Length, 5.1; diameter, 1.9 mm. (Bartsch.)

TYPE in United States National Museum, No. 340827. Type locality, off O'Neal Island, Puget Sound.

RANGE. Puget Sound.

Cerithiopsis ingens Bartsch, 1907

Proceedings of the United States National Museum, **3**:180; Pl. 41, fig. 4.

Shell large, elongate-conic, white. Nuclear whorls decollated. Post-nuclear whorls slightly shouldered at the summit, moderately well-rounded, marked on the first three turns by three spiral cords. On the fourth turn a fourth cord makes its appearance at the summit, rapidly increasing in strength until on the last three whorls it is quite equal to the other cords. These spiral cords are almost as wide as the spaces which separate them. In addition to the spiral cords, the whorls are marked by rather poorly developed, rounded axial ribs, of which 14 occur upon the first, 16 upon the second, 18 upon the third and fourth, 20 upon the fifth and sixth, 22 upon the seventh and eighth, and 24 upon the penultimate turn. The intersections of the spiral cords and axial ribs form rather rounded cusps which slope more gently anteriorly than posteriorly, while the spaces inclosed between are rather shallow, quadrangular pits having their long axes parallel with the spiral sculpture. Sutures moderately constricted, showing the posterior edge of the first basal cord. In addition to the above sculpture, the entire surface of the spire is marked by very slender lines of growth, and, on the last whorl, by very slender, intercalated, spiral lirations between the cords. Periphery of the last whorl marked by a channel equal to the space between the cords on the spire. Base moderately long, well-rounded, ornamented with six, strong, spiral keels, which decrease regularly in size and spacing from the periphery to the columella. Aperture irregularly oval, strongly channeled anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within, rendered decidedly wavy at the edge by the external sculpture; columella moderately long, somewhat twisted, and reflected; parietal wall covered with a thin callus. Length, 12.5; diameter, 4.2 mm. (Bartsch.)

TYPE in United States National Museum, No. 32212. Type locality, Monterey, California.

RANGE. Known only from type locality.

Cerithiopsis tumida Bartsch, 1907

Proceedings of the United States National Museum, **33**:179; **40**: Pl. 41, fig. 3.

Shell medium size, light yellowish-brown, shining. Nuclear whorls decollated. Post-nuclear whorls somewhat inflated, well-rounded, separated by a constricted suture and ornamented with strong tuberculate axial ribs, of which there are 18 upon the second of the remaining whorls and 22 upon the penultimate turn. In addition to the axial ribs there are four, unequally broad, low, spiral ridges between the sutures, which are much wider than the spaces which separate them, the latter appearing as strongly incised lines. The intersection of these ridges and the ribs form the tubercles. The whorls slope gently from the second spiral ridge toward the summit and the first row of tubercles, which is only feebly developed and is located on the sloping shoulder. The second set of tubercles are rounded, while the third and fourth rows are decidedly elongated. Periphery of the last turn marked by a strong smooth spiral keel, which is separated from the supraperipheral keel by a mere constriction. Base rather short, without keel, marked only by lines of growth. Aperture suboval, decidedly channeled anteriorly; outer lip rendered sinuous by the external sculpture; columella short, very broad, and slightly expanded at the insertion, a little lighter in color than the rest of the shell; provided with a strong callus on its inner edge which is reflected over the parietal wall. Length, 4.2; diameter, 1.7 mm. (Bartsch.)

Type in United States National Museum, No. 74001. Type locality, Monterey, California.

Range. Known only from the type locality.

Cerithiopsis truncata Dall, 1886

Plate 70, fig. 2

Proceedings of the United States National Museum, **9**:304; Pl. 4, fig. 5.

Shell wax yellow. (Nucleus and early whorls decollated.) The four remaining, well-rounded, ornamented with three tuberculate spiral keels, of which the median is the strongest; the weakest is at the summit, which it crenulates. The last is midway between the suture and the median cord. In addition to the spiral cords, the whorls are marked by low, well-rounded, vertical, axial ribs, the intersection of which with the spiral cord renders them feebly tuberculate. Of these ribs, 30 occur upon the penultimate whorl and 22 upon the preceding turns. The spaces inclosed between the spiral cords and the axial ribs are squarish, well-impressed pits. A slender thread of the base is apparent in the somewhat constricted suture. Periphery of the last whorl marked by a sulcus which is about as wide as the spaces between the first and median cord and crossed by feeble continuations of the axial ribs. Base short, well-rounded, with a slender fasciole at the insertion of the columella; entire surface of spire and base crossed by rather strong, incremental lines and numerous fine striations; aperture broadly ovate; decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered wavy by the external sculpture; columella short, very broad, curved; parietal wall glazed with a thin callus which extends from the columella to the posterior angle. Length, 3.1; diameter, 1.9 mm. (Bartsch.)

Type in United States National Museum, No. 213303. Type locality in the canals of sponges, at Unalaska.

Range. Unalaska Island, Alaska, to Puget Sound.

This was described as *Cerithiopsis stejnegeri truncata.*

Cerithiopsis fraseri Bartsch, 1921

Proceedings of the Biological Society of Washington, **34**:34.

Shell elongate-conic, chestnut brown. Nuclear whorls decollated. Post-nuclear whorls almost flattened, marked by moderately strong, rounded, slightly retractively slanting axial ribs, of which 18 occur upon the first, 16 upon the second to fourth, 18 upon the fifth, 20 upon the sixth and seventh, 26 upon the eighth and the last whorl. Intercostal spaces about half as wide as the ribs. The spiral sculpture consists of three strong cords, of which the first, at the summit, is a little less strong on the early whorls than the other two, but on the last two whorls equals the other two cords. The intersection of the axial ribs and spiral cords forms strong tubercles, rounded on the first cord, slightly truncated posteriorly on the median cord, and strongly rounded anteriorly and strongly truncated on the third cord posteriorly and gently sloping anteriorly. The spaces inclosed between the axial ribs and spiral cords are well-rounded pits. Suture strongly impressed, the extreme appressed portion of the summit appearing as a slender sinuous spiral thread. Periphery of the last whorl marked by a sulcus about half as wide as that separating the median from the third cord. Base short, well-rounded, marked by the feeble continuations of the axial ribs which extend more or less threadlike over the base, and two strongly impressed spiral lines on the posterior fourth of the base. The space separating the first from the second of these spiral lines is about as wide as that separating the first from the peripheral sulcus. There is no spiral cord at the insertion of the columella. Aperture decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered wavy at the edge by the external sculpture, which is visible through the substance of the shell; inner lip decidedly sinuous, reflected over and appressed to the columella; parietal wall provided with a thin callus. Length, 6.5; diameter, 2.3 mm. (Bartsch.)

Type in United States National Museum, No. 340858. Type locality, Clayoquot, British Columbia.

Range. Clayoquot to Victoria and Nanaimo, British Columbia.

Cerithiopsis willetti Bartsch, 1921

Proceedings of the Biological Society of Washington, **34**:36.

Shell large, robust, elongate-conic, pale brown. All but the last nuclear whorl decollated. This shows, however, that the species belongs to the subgenus *Cerithiopsina.* Post-nuclear whorls crossed by very strong, almost sublamellar, rather coarse, rounded, protractively slanting, axial ribs, of which 16 occur upon the first to fifth, 18 upon the sixth, 20 upon the seventh, and 24 upon the last turn. Intercostal spaces about two-thirds as wide as the ribs. In addition to the axial ribs there are three strong spiral cords, of which the first is about as far anterior to the summit of the whorls as it is distant from the median neighbor. The first of these spiral cords is a little less strongly developed on the earlier whorls than on the succeeding turns, where it almost equals the other two. The junction of the axial ribs and spiral cords forms strong tubercles, of which those on the cord are truncated posteriorly and slope gently anteriorly. The same is true of the suprasutural cord. On the last whorl, however, the tubercles are more elongated and the truncation at the anterior margin is less pronounced, the long axis of the tubercles coinciding with the axis of the shell. The spaces inclosed between the axial ribs and spiral cords are well-rounded pits. The summit of the whorl falls a little anterior to the peripheral cord, and lets this appear as a narrow, smooth, sinuous thread in the somewhat constricted suture. Periphery of the last whorl marked by a strong cord, which constitutes the termination of the axial ribs. Base short and rounded, but concave at the junction with the columella. The junction of the columella and the base is marked by a slender spiral cord. Aperture broadly oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous by the external sculpture, which is also seen within the aperture by transmitted light; inner lip reflected over and appressed to the columella. Length, 7.5; diameter, 2.5 mm. (Bartsch.)

TYPE in United States National Museum, No. 268746. Type locality, Forrester Island, Alaska.

RANGE. Forrester Island, Alaska, to Puget Sound.

Cerithiopsis signa Bartsch, 1921

Proceedings of the Biological Society of Washington, **34**:36.

Shell elongate-conic, pale brown. First half post-nuclear whorl smooth, the next one and a half well-rounded and marked by rather distantly spaced, almost vertical axial ribs. Post-nuclear whorls appressed at the summit, marked by strong, rounded, almost vertical axial ribs, of which 18 occur upon the first, 14 upon the second to sixth, 16 upon the seventh, and 18 upon the last turn. The spiral sculpture consists of three strong, equally spaced cords, which are crossed by strong axial ribs. The intersections of the axial ribs and the spiral cords form strong tubercles, which are truncated on their posterior margin, and slope gently anteriorly in all three groups. The spaces inclosed between the cords and the ribs are elongated pits, which have their long axis coinciding with the spiral sculpture. In addition to this, the entire surface of the spire is marked by axial lines of growth and closely spaced spiral striations. Suture strongly impressed. Periphery of the last whorl rendered angulated by a keel. Base short, slightly concave at the insertion of the columella, marked by fine lines of growth and very fine spiral striations, and a slender spiral thread at the insertion of the columella. Aperture subquadrate; decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the spiral cords; inner lip sigmoid, reflected over and appressed to the columella. Length, 5.5; diameter, 2.7 mm. (Bartsch.)

Type in United States National Museum, No. 340826. Type locality, off O'Neal Island, Puget Sound.

Range. Puget Sound.

Cerithiopsis columna Carpenter, 1864

Plate 68, fig. 6

Supplementary Report, British Association for the Advancement of Science, 660. *Proceedings of the United States National Museum*, **40**: Pl. 36, fig. 6.

C. testa majore, valde elongata, purpureo-fusca; anfr. norm. ix, planatis, suturis distinctis; seriebus iii nodulorum spiralibus valde appressorum, creberrimorum, interstitiis parvis, altis; aliis interdum intercalantibus; lira quarta supre suturam haud valde nodulosa, liris duabus haud expressis aream suturalem circumeuntibus; basi planata, haud sculpta, ad peripheriam obtuse angulata; apertura quadrata. Long., .38; long. spir., .32; lat., 1 poll. (Carpenter.)

Shell elongate-conic, light chestnut brown. (Early whorls decollated.) Succeeding turns very slightly rounded, marked by three tuberculate spiral keels, of which one is at the summit, another a little above the periphery and a third a little nearer the posterior than its suprasutural neighbor. These keels are separated by spiral grooves, which are only about one-third as wide as the keels. In addition to the spiral keels, the whorls are marked by almost vertical axial ribs, which are about two-thirds as strong as the spiral cords and very closely spaced. Of these, 16 occur upon the second and third, 18 upon the fourth, 22 upon the fifth and sixth, 24 upon the seventh, 26 upon the eighth, and 32 upon the penultimate turn. The narrow spaces inclosed between the ribs and spiral cords appear as small, well-impressed, rounded pits. Suture moderately constricted, showing the posterior edge of the first basal keel in the early whorls. Periphery of the last whorl marked by a sulcus as wide as those that separate the keels on the spire, and the continuation of the axial ribs. Base short, well-rounded, marked with three slender spiral keels which are situated on the posterior two-thirds and separated by shallow channels. The first of these is crossed by slender continuations of the axial ribs. The space immediately about the base of the columella is free of sculpture, excepting fine, incremental lines. Aperture subquadrate, decidedly channeled anteriorly; posterior angle acute; outer lip rendered sinuous by the external sculpture; columella very broad at base, stout, somewhat twisted and curved, and the edge reflected. Length, 9.2; diameter, 2.6 mm. (Bartsch.)

Type in United States National Museum, No. 14823b. Type locality, Neah Bay, Washington.

Range. Vancouver Island to Monterey Bay, California.

Cerithiopsis arnoldi Bartsch, 1911

Plate 69, fig. 3

Proceedings of the United States National Museum, **40**:357; Pl. 39, fig. 3.

Shell elongate-conic. (Nuclear whorls decollated.) The post-nuclear whorls slightly rounded, ornamented by three tuberculate spiral keels of which one is at the summit, the anterior at some little distance above the suture, and the third halfway between the two. The posterior of these three keels is much weaker than the other two on the early turns, but gradually increases in size until on the last volution it is practically equal to them. In addition to the spiral keels, the whorls are marked by somewhat protractive axial ribs, which are not as strong as the spiral keels and render them tuberculate at their junctions. Of these ribs, 14 occur upon the first of the remaining turns, 16 upon the third, 18 upon the fourth, 20 upon the fifth, 22 upon the sixth, and 24 upon the seventh and eighth, and 26 upon the penultimate turn. The spaces inclosed between the ribs and spiral cords are strongly impressed, rounded pits. Sutures moderately constricted, showing the posterior edge of the first basal cord. Periphery of the last whorl marked by a deep sulcus, as wide as those occurring between the spiral cords on the spire, and, like them, crossed by the continuations of the axial ribs. Base very short, almost flattened, somewhat concave near the columella, marked by two spiral cords of which the first is immediately below the peripheral sulcus, while the next, which is less strong, is separated from it by a narrow channel. The anterior limit of this cord is a mere impressed line. There is another impressed line a little anterior to this one. Aperture decidedly channeled anteriorly; posterior angle obtuse (outer lip fractured); columella short, stout, curved and slightly twisted. Length, 5.4; diameter, 1.8 mm. (Bartsch.)

Type in United States National Museum, No. 195195. Type locality, San Pedro Bay, California.

Range. Known only from type locality.

Cerithiopsis stephensae Bartsch, 1909

Plate 69, fig. 7

Proceedings of the United States National Museum, **37**: 399. Also **40**: Pl. 39, fig. 7.

Shell elongate-conic, chocolate brown. (Nuclear whorls decollated in all the specimens seen.) Post-nuclear whorls well-rounded, ornamented spirally by four keels between the sutures, of which the posterior three are strong and tuberculate, the fourth smooth and slender. Axially the whorls are marked by irregular ribs, the junctions of which with the spiral keels form tubercles. The posterior row of tubercles is at the summit and is the weakest, the individuals appearing as rounded knobs. The second is on the middle of the whorl. This and the first, which is immediately above the peripheral sulcus, have their tubercles of about equal strength. On these two keels the tubercles slope gently anteriorly and very abruptly posteriorly. The peripheral sulcus and the other two sulci are equally strong and wide. All are crossed by ribs, which, however, do not extend over the base. Both spiral cords and ribs are crossed by strong incremental lines. Sutures constricted. Periphery of the last whorl marked by a deep channel. Base well-rounded, rather short, marked by strong incremental lines and a few very fine spiral striations. The summit of the succeeding whorl drops a little below the peripheral sulcus in all the whorls of the spire and allows a narrow margin of the smooth base to appear as a cord in the suture. Aperture ovate, with a strong anterior sinus, outer lip thin, showing the external sculpture within; columella stout, twisted and curved, having a weak basal fasciole at its insertion. Length, 9; diameter, 2.1 mm. (Bartsch.)

TYPE in United States National Museum, No. 204008. Type locality, Bear Bay, Peril Strait, Alaska.

RANGE. Fort Frederick, Alaska, to Puget Sound.

Cerithiopsis fia Bartsch, 1927

Proceedings of the United States National Museum, **70**: 26; Pl. 5, figs. 6, 7.

Shell broadly conic, chestnut-brown. Nuclear whorls decollated excepting a portion of the last turn which has numerous slender distantly spaced, retractively slanting axial threads and numerous fine spiral threads in the intercostal spaces which are placed at right angles to the axial ribs. Post-nuclear whorls moderately rounded, marked by almost vertical axial ribs of which 14 occur upon the first and second, 16 upon the third and fourth, 18 upon the fifth and sixth, 20 upon the seventh, and 22 upon the last turn. These ribs are about as wide as the spaces that separate them. In addition to the axial sculpture, the whorls are marked by three strong spiral cords of which the first at the summit is a little weaker than the rest. These cords render their junction with the axial ribs strongly nodulose. The nodules of the cord at the summit are rounded; those of the other two cords are truncated posteriorly and slope gently anteriorly. The pits inclosed between the axial ribs and spiral cords are almost rounded. Periphery marked by a strong spiral cord which is separated from the first supraperipheral cord by a groove about as wide as that separating that cord from the median of the spire. The groove is crossed by the continuations of the axial ribs which extend feebly over the cord and render it weakly tuberculate. Base short, well-rounded, marked by four strong spiral cords which grow successively weaker from the posterior anteriorly. These are separated by grooves much narrower than the width of the cords, and they are rendered slightly tuberculated by the slender continuation of the axial ribs. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered sinuous at the edge by the external sculpture; inner lip sigmoid.

Type in United States National Museum, No. 340935. Type locality, Monterey Bay. It has nine whorls and measures, length, 7.4 mm.; diameter, 2.9 mm.

Cerithiopsis santacruzana Bartsch, 1927

Proceedings of the United States National Museum, **70**:27; Pl. 5, fig. 2.

Shell stout, very broadly conic, pale brown. Early nuclear whorls decollated, the last one and one-half marked by very slender, distantly spaced, decidedly protractively slanting axial riblets, while the broad spaces between them are marked by slender raised threads which are placed at right angles to the axial riblets. Postnuclear whorls moderately rounded, marked by strong, retractively slanting axial ribs. Of these, 16 occur upon the first to fourth, 18 upon the fifth, 20 upon the sixth and seventh, and 22 upon the penultimate turn. The spaces which separate the axial ribs are about as wide as the ribs. In addition to the axial sculpture, the whorls are marked between summit and suture by three strong spiral cords, of which the first, which is at the summit, is a little weaker than the other two on all the turns but the last. The junction of the axial ribs and spiral cords form strong tubercles which are truncated posteriorly and slope more gently anteriorly. The spaces inclosed between them are roundish pits. Suture moderately impressed. Periphery of the last whorl marked by a rather strong cord. The space separating this from the cords of the spire is crossed by the continuation of the axial ribs, which extend to the cord but do not cross it, nor do they tuberculate it. Base short, moderately rounded, marked by a spiral cord which is a little less strong than the one at the periphery from which it is separated by a channel a little narrower than that separating the peripheral cord from the first supraperipheral. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered wavy by the external sculpture; inner lip sigmoid.

Type in United States National Museum, No. 363785, comes from Santa Cruz, California. It has 10 whorls and measures, length, 5.9 mm.; diameter, 2 mm.

Genus **SEILA** A. Adams, 1861

Shell with simple spiral ribs. (Tryon, *Manual of Conchology.*)

Type. *Cerithiopsis dextroversa* Adams and Reeve.

Distribution. California to Panama, West Africa, China, Australia, Atlantic to West Indies, Scotland, Norway, Gulf of St. Lawrence, Mediterranean.

Seila montereyensis Bartsch, 1907

Proceedings of the United States National Museum, **33**:177. Also **40**: Pl. 41, fig. 5.

Shell large, robust, brown. (Extreme apex lost in all our specimens.) One of the cotypes has two and a half nuclear whorls remaining. These are rather inflated, evenly rounded, marked by many slender, obliquely retractive, axial riblets. The transition of the nuclear sculpture to the post-nuclear is very abrupt. The sculpture of the post-nuclear turn consists of three very strong, equal, and equally spaced lamellar spiral keels between the sutures. Channels separating the spiral keels well-rounded, a little wider than the keels, crossed by many subequal and subequally spaced slender riblets, of which about 40–50 appear on the whorls. Periphery of the last whorl marked by a fourth spiral keel not quite as strong as the keels of the spire and a little more closely placed to the keel posterior to it than that is to its neighbor above it. Base marked by a spiral keel which equals the peripheral keel in strength, separated from it by a channel a little narrower than the supraperipheral groove. Both of these channels are crossed by the axial riblets. The remaining portion of the base slopes somewhat concavely toward the stout columella. Under the microscope the entire surface of the spire and base appears marked by fine lines of growth and spiral striations. Aperture subquadrate, decidedly channeled anteriorly; outer lip rendered sinuous by the spiral keels, parietal wall and edge of columella covered by a moderately strong callus. The nuclear structures were described from a young specimen. Length, 3.6; diameter, 1.4 mm. The type has 10 whorls (the first two nuclear whorls probably being lost). (Bartsch.)

Cotype in United States National Museum, No. 195206. Type locality, Monterey, California.

Range. Monterey, California, to Todos Santos Bay, Lower California.

Genus **METAXIA** Monterosato, 1884

Base truncate, basal area not cingulate and concave, canal open, incipient. (Tryon, *Manual of Conchology.*)

Type. *Cerithiopsis rugulosa* Sowerby.

Distribution. California, Italy, Mediterranean.

Metaxia diadema Bartsch, 1907

Proceedings of the United States National Museum, **33**:182.

Shell slender, decidedly turreted, brown. Nuclear whorls four, the first smooth, the others marked by two spiral threads, the posterior one of which falls on the middle of the whorls between the sutures, while the anterior one is about halfway between it and the basal suture. In addition to this sculpture there are slender, equal, and equally spaced, axial riblets, of which about 28 occur upon the third and 30 upon the fourth whorl. The nuclear whorls are slopingly shouldered from the posterior keel to the summit and well-rounded anterior to it. The demarcation between the sculpture of the nuclear turns and the post-nuclear turns is abrupt. Post-nuclear turns inflated, marked by four, strong, spiral, tuberculate keels and axial ribs. These four keels are equally spaced, but not equally strong. The third excels all the others in development, the fourth or basal one comes next, the second next, while the one at the summit is the weakest of the four. The axial ribs are broad and strong and rather distantly spaced, forming decided nodes at their intersection with the spiral keels. There are about 14 of these ribs upon the first, 15 upon the fifth, and 22 upon the penultimate turn. The spiral keels connecting the tubercles are only about one-fourth as strong as the axial ribs; the areas inclosed by the two are quadrangular, the vertical diameter being the shorter. On the last whorl, where the ribs are a little more crowded, these areas become squarish. Sutures strongly constricted. Periphery of the last whorl marked by a strong keel, separated from the supraperipheral keel by a strong channel, which is crossed by the continuations of the axial ribs. Base rather short, sloping somewhat concavely from the peripheral keel to the insertion of the broad columella, marked by a weak spiral thread at the base of the columella and the continuation of the axial ribs, which extend well up on the columella. Aperture suboval, decidedly channeled at the junction of the lip and columella, with the posterior angle obtuse. Length, 3.8; diameter, 1.3 mm. (Bartsch.)

Cotypes in United States National Museum, No. 195203. Type locality, San Pedro, California.

Range. Monterey to off Point Loma, California.

APPENDIX

Since Parts I and II went to press, the following descriptions of new species were received. Genus *Astyris,* now so-called by Bartsch, was given in *Bulletin 112* as a subgenus and so arranged in this volume, Part I, p. 274. Dall also listed Genus *Opalia* as a subgenus (see *supra,* p. 51).

Subgenus ASTYRIS (see Part I, p. 274)

Astyris clementensis Bartsch, 1927

Proceedings of the United States National Museum, **70**: 2; Pl. 1, fig. 5.

Shell very small, elongate-ovate. Nuclear whorls flesh-colored. Postnuclear turns yellowish horn-colored with various zigzag markings and fulgurations of brown. Nuclear whorls smooth. Postnuclear whorls appressed at the summit, marked by very fine lines of growth which are almost vertical, and numerous, closely spaced, microscopic spiral striations. Suture very slightly constricted. Periphery of the last whorl well-rounded. Base long, moderately rounded; columella marked by eight feebly developed spiral cords. Aperture large; posterior angle acute, decidedly channeled anteriorly; outer lip thin showing the external markings within; inner lip sinuous; parietal wall covered with a thin callus.

TYPE in United States National Museum, No. 362456. Type locality, San Clemente Island, California. Length, 3.2 mm.; diameter, 1.5 mm.

This species is nearest related to *Astyris aurantiaca* Dall, but is uniformly smaller.

Subgenus OPALIA (see p. 51)

Opalia tremperi Bartsch, 1927

Proceedings of the United States National Museum, **70**: 3; Pl. 1, fig. 8.

Shell moderately large, milk-white. Nuclear whorls decollated. Postnuclear whorls marked by poorly developed, retractively slanting axial ribs which terminate at the summit in a series of cusps. Several ribs frequently fuse to form a single cusp. The ribs on the first two turns of the type are obsolete, on the third 20 are present, while the fourth has 22, the fifth 24, the sixth and last have 26. In addition to the axial sculpture there are also obsolete varices at irregular intervals. The entire surface of the spire is marked by narrow spiral cords. The spaces that separate these cords are crossed by numerous, very slender, axial threads which give them a decidedly pitted appearance. Suture slightly constricted. Periphery of the last whorl well-rounded. Base rather attenuated, marked by the continuations of the axial ribs and the same type of spiral sculpture described for the spire. Aperture large, decidedly oval, with a strongly expanded and thickened peristome; outer lip evenly curved; inner lip almost straight and continuing as a heavy callus over the parietal wall which renders the peritreme complete.

Type in United States National Museum, No. 362454. Type locality, San Clemente Island, California. Length, 7.8 mm.; diameter, 2.5 mm.

SECTION MELANELLA (see p. 68)

Melanella portlandica Bartsch, 1927

Proceedings of the United States National Museum, 70: 4; Pl. 1, fig. 6.

Shell of moderate size, regularly elongate-conic, milk-white, shining. Nuclear whorls decollated in the type. Postnuclear whorls narrow between the summit and suture with the summit appressed, very slightly rounded, marked at irregular intervals by varicial impressions. Suture only very slightly impressed. Periphery of the last whorl slightly inflated, strongly rounded. Base very short, strongly rounded. Aperture small, pyriform, oblique; posterior angle acute; peristome very much thickened; columella short, almost straight, decidedly thickened and reflected over the umbilical area as a thick callus; parietal wall covered by a thick callus.

Type in United States National Museum, No. 362492. Type locality, Portland, Oregon. Length, 9.1 mm.; diameter, 3.1 mm.

The short thickened aperture and short base will at once distinguish this from *Melanella micans.* There is a suggestion of *Melanella (Balcis) thersites* but its straight form and general proportions differentiate it from that species.

Subgenus Graphis (see p. 83)

Aclis californica Bartsch, 1927

Proceedings of the United States National Museum, 70: 4; Pl. 1, fig. 2.

Shell small, pupiform, thin, bluish white. Nuclear whorls not differentiated from the postnuclear turns. All the whorls well-rounded, appressed at the summit which is finely crenulated, the rest marked by fine lines of growth which are somewhat retractively slanting. The type is slightly worn and shows no indication of spiral sculpture. Sutures moderately constricted. Periphery of the last whorl inflated and strongly rounded. Base short, strongly rounded, narrowly umbilicated, marked like the spire. Aperture subquadrate; posterior angle decidedly obtuse; outer lip thin; columella almost straight, reflected over and appressed to the base for its posterior fifth; parietal wall covered with a thin callus.

Type in United States National Museum, No. 362455. Type locality, San Clemente Island. Length, 5 mm.; diameter, 2.1 mm.

Subgenus PYRGOLAMPROS (see pp. 87 and 107)

Turbonilla stelleri Bartsch, 1927

Proceedings of the United States National Museum, **70**:6; Pl. 2, fig. 4.

Shell very regularly elongate-conic, flesh-colored, with a broad zone of pale brown which extends from a little anterior to the periphery on the base posteriorly over half of the whorl. Nuclear whorls decollated. Postnuclear whorls appressed at the summit, which is very narrowly shouldered, decidedly flattened in the middle, and moderately constricted at the suture, marked by very regular, vertical axial ribs, of which 16 occur upon all but the last two turns, on which 18 are present. These ribs are about as wide as the spaces that separate them, on the first three turns; on the middle turns they are only half as wide, while on the last turn the intercostal spaces are about one and one-half times as wide as the ribs. In addition to the axial ribs the whorls are marked by fine lines of growth and numerous, very closely spaced spiral striations, which extend over both ribs and intercostal spaces. Periphery of the last whorl well-rounded. Base short, well-rounded, marked by the feeble continuations of the axial ribs, which evanesce shortly after passing the periphery, and numerous, closely spaced spiral striations. Aperture large, subquadrate, posterior angle obtuse; outer lip thin showing the external sculpture and color markings within; columella somewhat twisted, almost vertical, slightly reflected and appressed to the base for the posterior third of its length; parietal wall covered with a thin callus.

Type in United States National Museum, No. 362146. Type locality, Shuyak Strait, Afognak Island, Alaska. Length, 8.3 mm.; diameter, 2.2 mm. This species is a member of the *Turbonilla (Pyrgolampros) halia* Dall and Bartsch group. It differs from the other known members by its coloration and flattened whorls, as well as by its size.

Turbonilla ilfa Bartsch, 1927

Proceedings of the United States National Museum, **70**:7; Pl. 1, fig. 1.

Shell very large. Nuclear whorls decollated. The eight and a quarter turns remaining narrowly shouldered at the summit, slightly rounded in the middle, somewhat contracted toward the base, marked by strong, well-rounded axial ribs, which are closely spaced on the early whorls, rather distantly on the middle whorls, and again closely placed on the last turn, where they become somewhat enfeebled. Of these ribs, which are almost vertical, 22 occur upon the first of the remaining turns, 24 upon the second to sixth, 26 upon the seventh, and 30 upon the last. The spaces between the ribs are strongly impressed and almost as wide as the ribs on the first two turns. On the next four they are decidedly wider than the ribs, while on the next to the last they again equal the ribs and on the last they are narrower. The entire surface of the spire is marked, in addition, by fine spiral striations. Periphery of the last whorl well-rounded. Base moderately long, well-rounded, marked by the feeble continuations of the axial ribs and the fine microscopic spiral striations. Aperture oval; posterior angle acute; outer lip thin; inner lip somewhat sinuous, reflected over, but not appressed to the base; parietal wall covered by a thick callus.

Type in United States National Museum, No. 340819. Type locality, San Pedro, California. Length, 12.5 mm.; diameter, 4 mm. This is the largest of the known West American *Pyrgolampros*.

Turbonilla shuyakensis Bartsch, 1927

Proceedings of the United States National Museum, **70**: 7; Pl. 2, fig. 1.

Shell broadly conic, stout, flesh-colored, with a broad band of chestnut brown encircling the periphery. This band extends almost as far anterior to the periphery as it does upon the base. Nuclear whorls decollated. Postnuclear whorls rather inflated, appressed at the summit, slightly rounded near the summit and the periphery and somewhat flattened in the middle, marked by very strong, slightly protractively curved, rounded axial ribs, of which 16 occur upon the first four of the remaining turns, and 18 upon the rest. The intercostal spaces, which are about as broad as the ribs, are deeply impressed. In addition to the strong axial ribs, the whorls are marked by fine incremental lines which are apparent in both intercostal spaces and on the ribs; they are also marked by rather strong, closely spaced spiral striations. Suture strongly impressed, constricting the whorls. Periphery angulated. Base short, slightly inflated, well-rounded, marked by the very feeble continuations of the axial ribs, which evanesce shortly after passing the periphery, numerous lines of growth, and closely spaced, strong spiral striations. Aperture rather large, broadly oval, posterior angle obtuse; outer lip thin, showing the external markings as well as the color bands within; columella slender, slightly curved, and slightly reflected over the base to which it is appressed for the posterior half of its length.

Type in United States National Museum, No. 362144. Type locality, Shuyak Strait, Afognak Island, Alaska. Length, 6.3 mm.; diameter, 2.4 mm.

This species is nearest related to *Turbonilla (Pyrgolampros) newcombei* Dall and Bartsch, which is known from British Columbia and Washington. It differs from the latter in being in every way more robust and in having the whorls more inflated.

Turbonilla middendorffi Bartsch, 1927

Proceedings of the United States National Museum, **70**: 8; Pl. 2, fig. 2.

Shell elongate-conic, flesh-colored, excepting a broad band of bright chestnut brown which extends over the periphery and considerably anterior and posterior to this. Nuclear whorls two and one-half, forming a depressed helicoid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which the nuclear spire is about one-sixth immersed. Postnuclear whorls rather high, appressed at the summit, marked by broad, low, rather closely spaced, almost vertical axial ribs, which are very feebly expressed on the early turns. Of these ribs there are 18 on the third, 20 on the fourth and fifth, 22 on the sixth, and 24 on the last whorl. The spaces separating the ribs are only about one-half as wide as the ribs. In addition to the axial sculpture the whorls are marked by numerous, closely spaced, spiral striations. Suture moderately constricted. Periphery of the last whorl somewhat inflated. Base moderately long, inflated, marked by the feeble continuations of the axial ribs, which evanesce shortly after passing the periphery, and numerous, closely spaced spiral striations. Aperture rather large, posterior angle acute; outer lip thin, showing the external markings and color band within; columella slender, somewhat sinuous, slightly reflected over the base to which the posterior third is adnate; parietal wall covered by a thin callus.

Type in United States National Museum, No. 362147. Type locality, Afognak Island, Alaska. Length, 6.4 mm.; diameter, 2.0 mm.

Turbonilla eyerdami Bartsch, 1927

Proceedings of the United States National Museum, **70**: 9; Pl. 2, fig. 12.

Shell large, elongate-conic, golden yellow, with a moderately broad band of pale chestnut brown at the periphery. Nuclear whorls decollated. Postnuclear whorls appressed at the summit which is narrowly shouldered, flattened in the middle, moderately constricted at the suture, marked by rather strong, regular and regularly spaced, axial ribs, which are slightly protractively slanting on the early turns, vertical in the middle, and slightly retractively slanting on the last whorl. Twenty-two of these ribs occur upon the first to the third turns, 20 upon the fourth to the seventh, 18 upon the eighth, 22 upon the ninth, and 30 upon the last whorl. These ribs are about as wide as the spaces that separate them. The ribs and the intercostal spaces are marked by numerous, closely spaced spiral striations. Suture moderately constricted. Periphery of the last whorl inflated, well-rounded. Base short, somewhat inflated, well-rounded, marked by the feeble continuations of the axial riblets, which evanesce shortly after passing the periphery, and numerous lines of growth and closely spaced spiral striations. Aperture oval, posterior angle acute, outer lips thin, showing the external sculpture and the color markings within; columella slightly curved, reflected over and appressed to the base for half of its length; parietal wall covered by a thin callus.

Type in United States National Museum, No. 362145. Type locality, Shuyak Strait, Afognak Island, Alaska. It has lost the nucleus. The 10½ postnuclear whorls measure, length, 10.5 mm.; diameter, 2.7 mm. This is a member of the *Turbonilla (Pyrgolampros) halia* Dall and Bartsch group. It is not particularly closely related to any of the described species.

Subgenus Pyrgiscus (see p. 123)

Turbonilla delmontensis Bartsch, 1927

Proceedings of the United States National Museum, **70**: 9; Pl. 2, fig. 11.

Shell elongate-conic, golden brown, with the incised spiral lines edged with red. Nuclear whorls decollated. Postnuclear whorls moderately rounded, narrowly shouldered at the summit, crossed by strong, slightly protractively slanting axial ribs, of which 14 occur upon the fourth and fifth of the remaining turns, 16 upon the sixth, 18 upon the seventh, 22 upon the eighth, and 28 upon the last whorl, upon which they are somewhat enfeebled and less regularly developed and spaced. The intercostal spaces are about twice as wide as the ribs and are crossed by six equally spaced, incised spiral lines, of which the second is about three times as wide as the first, third, and fourth, while the fifth and sixth have about double the width of the narrow ones. Suture strongly constricted. Periphery of the last whorl well-rounded, somewhat inflated. Base short, moderately rounded, marked by somewhat irregularly spaced and irregularly developed fine spiral lines, of which there are more than 15. The exact number cannot be determined on account of the erosion of the base. Aperture short, almost subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip almost vertical, reflected over and appressed to the base for almost half its length.

Type in United States National Museum, No. 340818. Type locality, in 10 fathoms off Del Monte, California. It has nine post-nuclear whorls and measures, length, 9.7 mm.; diameter, 2.7 mm. This species is nearest related to *Turbonilla (Pyrgiscus) auricoma* Carpenter and *Turbonilla (Pyrgiscus) castanea* Keep.

Subgenus MORMULA (see p. 144)

Turbonilla enna Bartsch, 1927

Proceedings of the United States National Museum, **70**: 10; Pl. 2, fig. 8.

Shell elongate-conic, pale brown. Nuclear whorls decollated. Postnuclear whorls marked by very slightly retractively slanting, low, poorly developed axial ribs which are a little broader than the spaces that separate them. Of these ribs, 18 occur upon the second, 22 upon the third and fourth, 24 upon the fifth and sixth, 26 upon the seventh, while upon the remaining turns they become more irregular and more numerous and ill-defined. In addition to this the whorls are marked by five spiral lines of pits in the intercostal spaces which extend up on the sides of the ribs but scarcely cross them. These pits are a little narrower than the spaces that separate them. There are also at irregular intervals indications of varices. Aperture moderately large, oval, posterior angle obtuse; outer lip fractured, showing six strong spiral folds within, of which three are anterior and three posterior to the periphery; columella slightly expanded and reflected over the umbilicus; parietal wall covered by a rather thick callus.

TYPE in United States National Museum, No. 362440. Type locality, in six fathoms off Deadman Island, San Pedro, California. It has almost nine whorls remaining and measures, length, 11.6 mm.; diameter, 2.8 mm.

Turbonilla clementina Bartsch, 1927

Proceedings of the United States National Museum, **70**: 11; Pl. 2, figs. 9, 10.

Shell broadly elongate-conic, chestnut brown. Nuclear whorls a little more than two, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which the nuclear spire is about one-fifth immersed. The nuclear whorls project slightly beyond the left outline of the postnuclear spire. First postnuclear whorl well-rounded, the succeeding five somewhat shouldered, about one-third the distance between the summit and the suture, anterior to the summit, while the last three are slightly rounded and rendered slightly concave below the somewhat excurved summit. The whorls are marked by slightly protractive axial ribs, which are strong on the early whorls and become enfeebled on the later turns. Of these ribs, 24 occur upon the first, 20 upon the second, 18 upon the third, 20 upon the fourth and fifth, 24 upon the sixth, 26 upon the seventh, 30 upon the eighth, and 34 upon the last turn. The spaces which separate these ribs are a little narrower than the ribs on the early turns, and about equal to the ribs on the last turn. In addition to the axial ribs the whorls are marked by six strong, incised spiral lines, which almost equally divide the posterior three-fourths of the whorls. The space between the summit and the first strongly incised pit is marked by five fine incised spiral lines, while the space between the fourth and fifth pit is also divided by a fine spiral line, which is a little nearer the fourth pit than the fifth. Sutures rendered rather conspicuous by the very narrowly shouldered summit of the whorls. Periphery of the last turn well-rounded. Base short, well-rounded, marked by 15 incised spiral lines, which gradually diminish in spacing and strength from the periphery to the umbilicus. The six at the umbilical region are very fine and very closely crowded. The rest increase regularly in size and spacing, excepting the fourth anterior to the periphery, which is much finer than the third and fifth. Aperture subquadrate; posterior angle obtuse; outer lip thin; inner lip almost vertical, reflected over and appressed posteriorly for about one-third of its distance to the base; parietal wall covered by a thin callus.

Type in United States National Museum, No. 340933. Type locality, San Clemente Island, California. It has nine and a half whorls and measures, length, 7.6 mm.; diameter, 2.3 mm. This species is nearest related to *Turbonilla (Pyrgolampros) dora* Bartsch.

Subgenus SALASSIELLA (see pp. 152–153)

Odostomia oenoa Bartsch, 1927

Proceedings of the United States National Museum, **70**: 12; Pl. 2, fig. 3.

Shell rather large, conic, grayish white. Nuclear whorls decollated. Postnuclear whorls rather high between the summit and the periphery, slopingly shouldered at the summit, marked by 24 somewhat retractively slanting, axial riblets which are separated by shallow intercostal spaces, the latter being a little narrower than the riblets. These riblets extend from the summit to the periphery while from the periphery basally they gradually evanesce. Suture rather strongly constricted. Base moderately long, well-rounded. Aperture oval; posterior angle obtuse; columella provided with a strong oblique fold which is situated a little anterior to the insertion of the columella; parietal wall covered by a rather thick callus.

Type in United States National Museum, No. 362441. Type locality, in 6 fathoms off Deadman Island, San Pedro, California. It has almost seven whorls and measures, length, 7 mm.; diameter, 2.1 mm.

Subgenus CHRYSALLIDA (see p. 155)

Odostomia tremperi Bartsch, 1927

Proceedings of the United States National Museum, **70**: 14; Pl. 3, fig. 1.

Shell very elongate-conic, bluish white. Nuclear whorls at least two, smooth, forming a depressed helicoid spire, the axis of which is obliquely immersed in the first of the succeeding turns above which a little less than half the nuclear spire projects. Postnuclear whorls marked by rather strong, retractively slanting, axial ribs which are a little broader than the spaces that separate them. Of these ribs 14 occur upon the first, 16 upon the second to fourth, 18 upon the fifth and last turns. In addition to this the whorls are marked by four spiral cords which render the junction with the axial ribs tuberculated. The tubercules are rounded on the middle whorls and slightly elongated on the last turn, the elongation corresponding with the spiral sculpture. The spaces inclosed between the axial ribs and the spiral cords are deeply impressed, rounded pits. Suture strongly constricted, channeled. Periphery of the last whorl marked by a rather broad channel. Base rather long, marked by eight spiral cords of which the first two, near the periphery, are much stronger than the rest, the others becoming successively weaker. In addition to this the deep channels between the spiral cords are crossed by numerous slender axial threads which give them a finely ribbed appearance. Aperture elongate-oval; decidedly angulated anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within, and sinuous at the edge; columella twisted, provided with a rather oblique fold a little anterior to its insertion; parietal wall covered by a rather thick callus.

Type in United States National Museum, No. 362446. Type locality, San Clemente Island, California. It has six and one-half postnuclear whorls and measures, length, 3.7 mm.; diameter, 1.2 mm.

Odostomia clementensis Bartsch, 1927

Proceedings of the United States National Museum, **70**: 15; Pl. 3, fig. 2.

Shell very broadly conic, bluish white. Nuclear whorls decollated. Postnuclear whorls increasing rapidly in size, marked by poorly developed axial ribs which are strongest near the summit, but evanesce before reaching the periphery. Of these 20 occur upon all the whorls. These ribs are a little wider than the spaces that separate them. In addition to these ribs the whorls are marked by five spiral cords between the summit and periphery, of which the first three are narrow and of about equal width and occupy the posterior half of the turns. These render the axial ribs tuberculate, the tubercles being elongate, the elongation corresponding with the spiral sculpture. The anterior two spiral cords are much broader. The posterior of these is feebly tuberculate, while the anterior is smooth. The spaces separating the spiral cords on the spire are of the same width, and the spaces inclosed between the axial ribs and spiral cords are narrow elongated pits, the long axes of which coincide with the spiral sculpture. These spiral pits pass up on the sides of the ribs and usually cross them. The first supraperipheral incised spiral line not being interrupted by ribs forms a continuous pitted element. Periphery of the last whorl well-rounded, marked by a narrow, deeply incised channel which is also crossed by fine axial threads that render it pitted. Base well-rounded, marked by 13 spiral cords, of which the anterior 3 are very feeble, while the rest are very regular in size and spacing, becoming successively a little more slender from the periphery anteriorly. The spaces that separate these cords are almost as wide as the cords and are marked by slender axial threads which give to the spiral grooves a strongly pitted appearance. Aperture large; posterior angle obtuse; somewhat channeled at the junction of the columella and basal wall and decidedly flaring at the junction of the outer lip and basal lip; outer lip thin, showing the external sculpture within by the transmitted light, sinuous at the edge; columella very stout, rather evenly curved, provided with an oblique fold a little anterior to its insertion; parietal wall glazed with a thin callus.

TYPE in United States National Museum, No. 362447. Type locality, San Clemente Island, California. It has a little more than four post-nuclear whorls, having lost the nuclear turns, and measures, length, 3.2 mm.; diameter, 1.9 mm.

Odostomia chacei Bartsch, 1927

Proceedings of the United States National Museum, **70**: 16; Pl. 3, fig. 3.

Shell elongate-ovate, bluish white. Nuclear whorls two and one-half, well-rounded, forming a depressed helicoid spire which is about one-half obliquely immersed in the first of the succeeding turns. The tilted edge of the last volution shows four rather strong spiral cords. Postnuclear whorls stout, separated by a profoundly channeled suture, marked by exceedingly strong axial ribs which on all but the last whorls are slightly protractive; on the latter they are almost vertical. Of these ribs 16 occur upon the second and third and 18 upon the penultimate turn. The intercostal spaces are about as wide as the ribs. In addition to the axial sculpture the whorls are marked by four strong spiral cords which render their junction with the axial ribs strongly tuberculated. The tubercles are almost hemispherical, sloping only very slightly, a little more abruptly posteriorly than anteriorly. The spaces inclosed between the axial ribs and the spiral cords are well-rounded profound pits. The summit of the whorls is tabulated. The summits of the strong ribs render the suture slightly sinuate. Periphery of the last whorl marked by a rather strong spiral cord. Base moderately long, well-rounded, marked by five spiral cords which become slightly closer spaced from the peripheral cord anteriorly and also decidedly progressively enfeebled in the same direction. The broad spaces that separate the spiral cords are marked by numerous slender axial threads.

Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within by transmitted light; inner lip slightly curved, appressed to the succeeding whorl for two-thirds of its length, the anterior third only being free; parietal wall covered with a thick callus.

Type in United States National Museum, No. 361626. Type locality, Cayucos, California. It has five postnuclear whorls and measures, altitude, 2.9 mm.; diameter, 1.8 mm.

Odostomia catalinensis Bartsch, 1927

Proceedings of the United States National Museum, **70**: 17; Pl. 3, fig. 4.

Shell minute, bluish white, semitranslucent. Nuclear whorls deeply obliquely immersed in the first postnuclear turn, above which the tilted edge of the last turn only projects. Postnuclear whorls moderately rounded, marked by four strong spiral cords which are much wider than the spaces that separate them. Of these the first is at the summit. The axial sculpture is decidedly reduced on the first turn, becoming stronger on the second, while on the third there are 18 axial ribs which equal the spiral cords in strength. The junction of the axial ribs and spiral cords here form strong tubercles on the anterior three spiral cords, while the fourth is only slightly tuberculated. On the last whorl the axial ribs are very irregular and enfeebled. Here the axial sculpture consists chiefly of lines of growth, which are particularly conspicuous in the grooves between the spiral cords, where they appear as slender riblets. Particularly is this true in the groove at the periphery. Periphery well-rounded. Base moderately long, well-rounded, marked by seven spiral cords which grow successively narrower from the periphery toward the base, the last one at the base being a little wider than those immediately preceding it. Aperture oval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thin, showing the external markings within by transmitted light; columella slightly oblique, strongly reflected and appressed to the base, leaving only a very small chink at the umbilical area, and provided with a strong oblique fold at its insertion; parietal wall covered with a moderately thick callus.

Type in United States National Museum, No. 347989. Type locality, on *Abalone* at Catalina Island, California. It has four and one-half postnuclear whorls and measures, length, 3.1 mm.; diameter, 1.6 mm.

Subgenus Evalea (see p. 182)

Odostomia bachia Bartsch, 1927

Proceedings of the United States National Museum, **70**: 17; Pl. 2, fig. 7.

Shell very regularly elongate-ovate, bluish white. Nuclear whorls deeply obliquely immersed in the first of the postnuclear turns above which a small portion of the tilted edge of the last turn only projects, which gives to the shell a decidedly truncated appearance. Postnuclear whorls rather high between the summit and the suture very slightly rounded, appressed at the summit and very slightly contracted at the periphery, marked by very fine lines of growth and numerous, closely spaced, microscopic spiral striations. This sculpture is characteristic for the early whorls as well as the last. Suture slightly constricted. Periphery of the last whorl strongly inflated, rather obtusely angulated. Base short, strongly rounded, narrowly umbilicated, marked like the spire. Aperture broadly oval; posterior angle obtuse; outer lip thin; inner lip slightly curved, reflected over and appressed to the base and provided with an oblique fold a little anterior to its insertion; parietal wall covered with a thick callus.

Type in United States National Museum, No. 362450. Type locality, San Clemente Island, California. It has five and one-half whorls and measures, length, 3.6 mm.; diameter, 1.6 mm.

Odostomia eyerdami Bartsch, 1927

Proceedings of the United States National Museum, **70**: 18; Pl. 4, fig. 1.

Shell small, very elongate-ovate, bluish white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns above which the tilted edge of the last volution only projects. Postnuclear whorls high, moderately rounded, very slightly shouldered at the summit, marked by moderately strong, equal, and equally spaced spiral striations which have about the same strength on all the whorls. Periphery somewhat inflated, well-rounded. Base slightly prolonged, well-rounded, marked like the spire by lines of growth and spiral striations. Aperture elongate-ovate, protracted at the junction of the base and columella; posterior angle acute; outer lip thin; columella slightly oblique, almost straight, slightly reflected and appressed to the base for about half of its length; parietal wall covered with a thin callus.

Type in United States National Museum, No. 362149. Type locality, Shuyak Strait, Afognak Island, Alaska. It has five postnuclear whorls and measures, length, 4.3 mm.; diameter, 2.0 mm.

This species is nearest related to *Odostomia (Evalea) stephensi* Dall and Bartsch, from which it differs in being constantly, in every way, smaller.

Odostomia whitei Bartsch, 1927

Proceedings of the United States National Museum, **70**: 19; Pl. 4, fig. 3.

Shell very small, elongate-ovate, bluish white. Nuclear whorls smooth, deeply obliquely immersed in the first of the postnuclear turns above which the tilted edge of the last volution only projects. The nuclear spire is so obliquely placed that it gives the apex of the shell a truncated appearance. Postnuclear whorls very slightly rounded, not appressed at the summit, marked by rather strong, and deeply incised spiral lines; one a little heavier than the rest is situated a little below the summit and gives to this the appearance of being slightly keeled. In addition to this sculpture the whorls are marked by rather coarse lines of growth. Periphery of the last whorl angulated. Base short, well-rounded, not umbilicated, marked by the continuation of the axial ribs and incised spiral lines, which equal those on the spire in strength. Aperture pear-shaped; posterior angle acute; outer lip thin; columella slightly curved, reflected over and appressed to the base for its posterior two-thirds, and provided with a strong oblique fold opposite the umbilical chink; parietal wall covered with a heavy callus.

Type in United States National Museum, No. 362545. Type locality, Point Fermin, California. It has 4.8 whorls and measures, length, 2.2 mm.; diameter, 1.2 mm.

Odostomia strongi Bartsch, 1927

Proceedings of the United States National Museum, **70**: 19; Pl. 4, fig. 4.

Shell small, elongate-ovate, pale yellow, translucent. Nuclear whorls deeply obliquely immersed in the first postnuclear whorl, only half of the last turn showing, which is well-rounded and smooth. The early postnuclear whorls moderately rounded, marked by strong spiral grooves which separate the whorl into equal cords, of which 10 occur on the second whorl in the type. On the third whorl these cords become very much enfeebled and on the last they are entirely obsolete. On the last whorl the incremental lines are more conspicuous than on the preceding turns, probably largely due to the absence of spiral sculpture. Suture well-impressed. The portion at the summit of the shell appressed to the preceding turn appears as an opaque band. Periphery well-rounded. Base rather long, well-rounded, not umbilicated. Aperture elongate oval; outer lip thin, rather sigmoid; inner lip thin, reflected over and appressed to the base for three-fourths of its length, the anterior portion only being free, provided with a fold at the insertion of the columella; parietal wall covered by a thin callus.

Type in United States National Museum, No. 347804. Type locality, Catalina Island. It has almost four postnuclear whorls and measures, length, 3.5 mm.; diameter, 1.8 mm.

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PLATES AND EXPLANATION OF PLATES

PLATE 30

This plate from *Proceedings of the United States National Museum,* except Nos. 11, 11*a*, 12, 12*a*, and 12*b*.

FIGURE	PAGE
1. *Murex rhyssa* Dall	9
2. *Tritonalia interfossa* Carpenter Typical.	21
3. *Trophon tenuisculptus* Carpenter	39
4. *Trophon pacificus* Dall	35
5. *Tritonalia barbarensis* Gabb	25
6. *Trophon beringi* Dall	33
7. *Trophon tenuisculptus* Carpenter Frilled.	39
8. *Trophon rotundatus* Dall	29
9. *Trophon eucymata* Dall	35
10. *Trophon kamchatkanus* Dall	41
11, 11*a*. *Tritonalia fraseri* I. Oldroyd *Marine Shells of Puget Sound and Vicinity.*	25
12, 12*a*, 12*b*. *Purpura nuttallii aciculiger* Valenciennes Refigured type figures from the American Museum of Natural History.	15
13. *Coralliophila kincaidi* Dall	50
14. *Trophon orpheus* Gould From type.	37

NOTE—Unless otherwise stated the photographs were made by Crandall, Palo Alto, and the specimens are in the Stanford Collection. Natural size.

PLATE 30

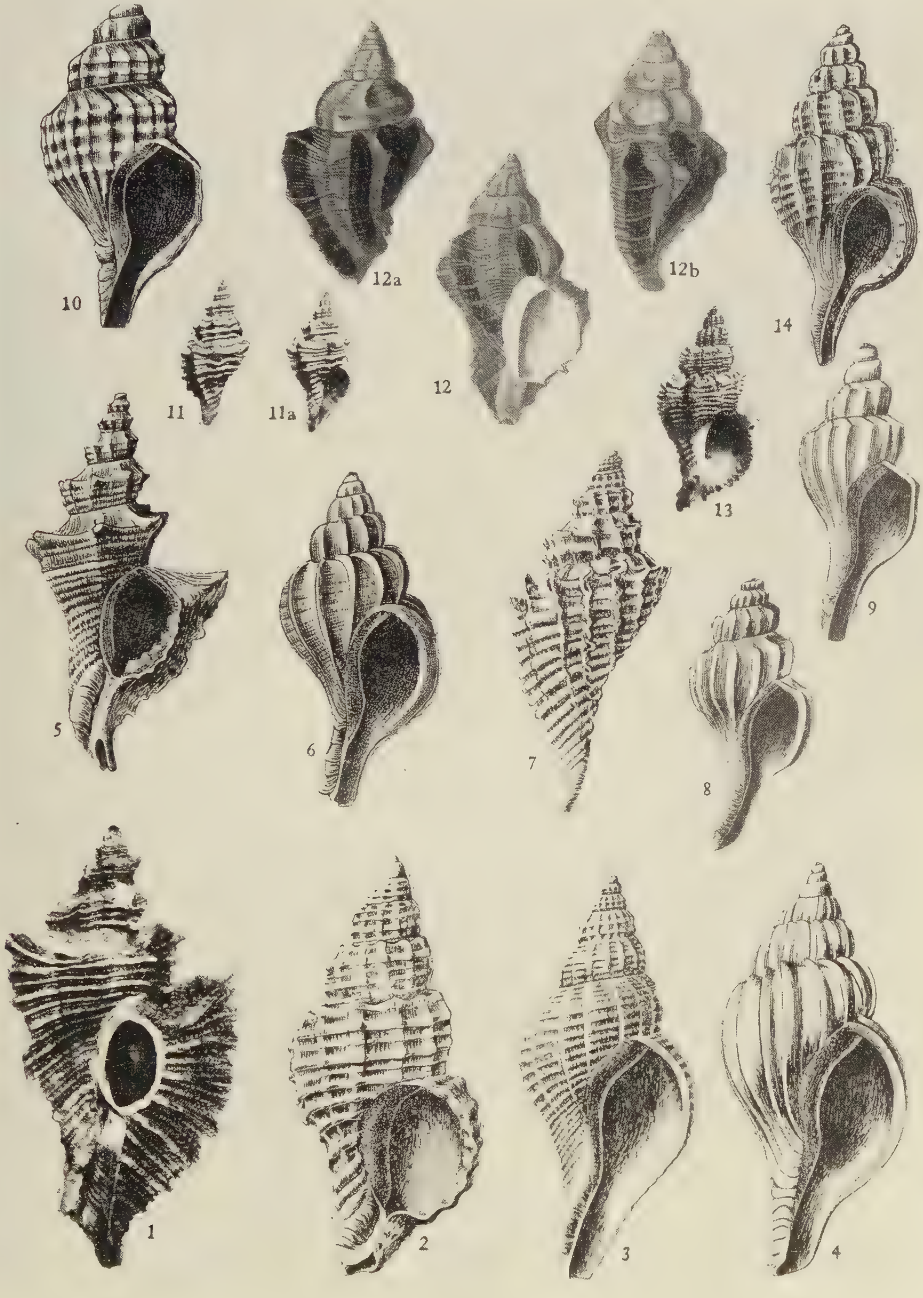

PLATE 31

This plate from United States National Museum except figures 9, 9*a*, and 12, from American Museum of Natural History, New York.

FIGURE		PAGE
1.	*Epitonium lowei* Dall	56
2.	*Epitonium sawinae* Dall	60
3.	*Epitonium caamanoi* Dall and Bartsch	62
4.	*Epitonium boreale* (Beck) Lyell	54
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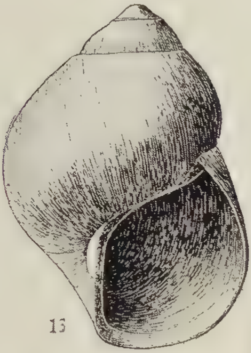
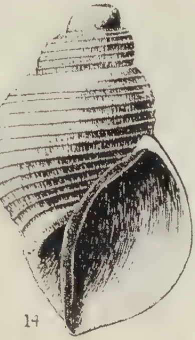
6.	*Iselica fenestrata* Carpenter	For description see, Part III
7.	*Trichotropis coronata* Gould	For description, see Part III
8.	*Trichotropis kelseyi* Dall	For description, see Part III
9, 9*a*.	*Trichotropis insignis* Middendorff American Museum of Natural History.	For description, see Part III
10.	*Trophon elegantulus* Dall	32
11.	*Tachyrhynchus lacteolus* Carpenter	For description, see Part III
12.	*Trichotropis conica* Möller American Museum of Natural History.	For description, see Part III
13.	*Anaplocamus borealis* Dall	For description, see Part III
14.	*Trichotropis kroyeri* Philippi	For description, see Part III
15.	*Pedicularia californica* Newcomb	240

PLATE 31


13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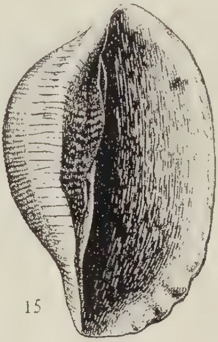
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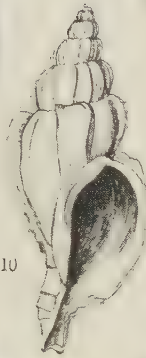
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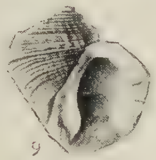
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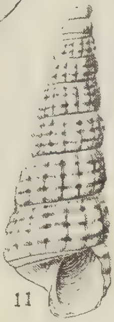
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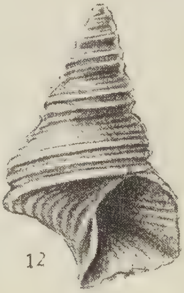
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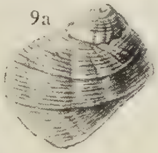
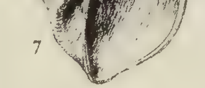

9a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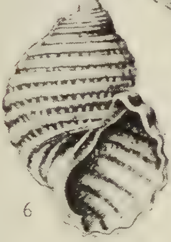
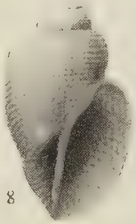

6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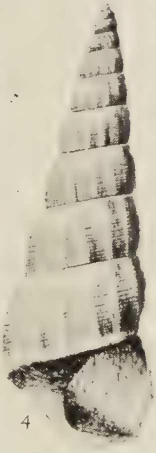
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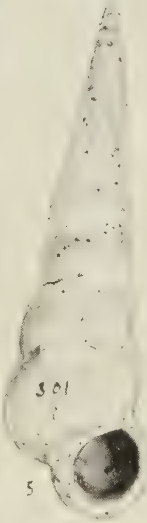
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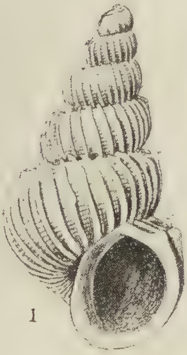
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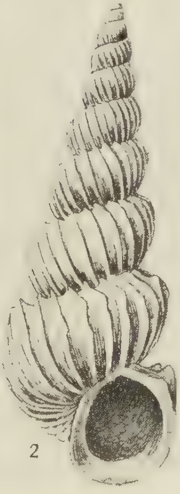

2

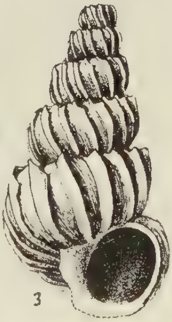

3

Plate 32

This plate from United States National Museum, *Bulletin 112,* except figures 2, 5, refigured type figures from the American Museum of Natural History, New York, and figures 8, 8*a* from the *Proceedings of the Zoölogical Society,* London.

FIGURE		PAGE
1.	*Tritonalia lurida aspera* Carpenter	17
2.	*Forreria belcheri* Hinds	49
3.	*Murex santarosanus* Dall	12
4.	*Tritonalia interfossa alpha* Carpenter	Not in text
5.	*Forreria belcheri* Hinds	49
6.	*Eupleura grippi* Dall	28
7.	*Tritonalia painei* Dall	20
8, 8*a*.	*Simnia vidleri* Sowerby	234
9.	*Lacuna porrecta* Carpenter	For description, see Part III
10.	*Fusinus robustus* Trask	For description, see Part I

PLATE 32

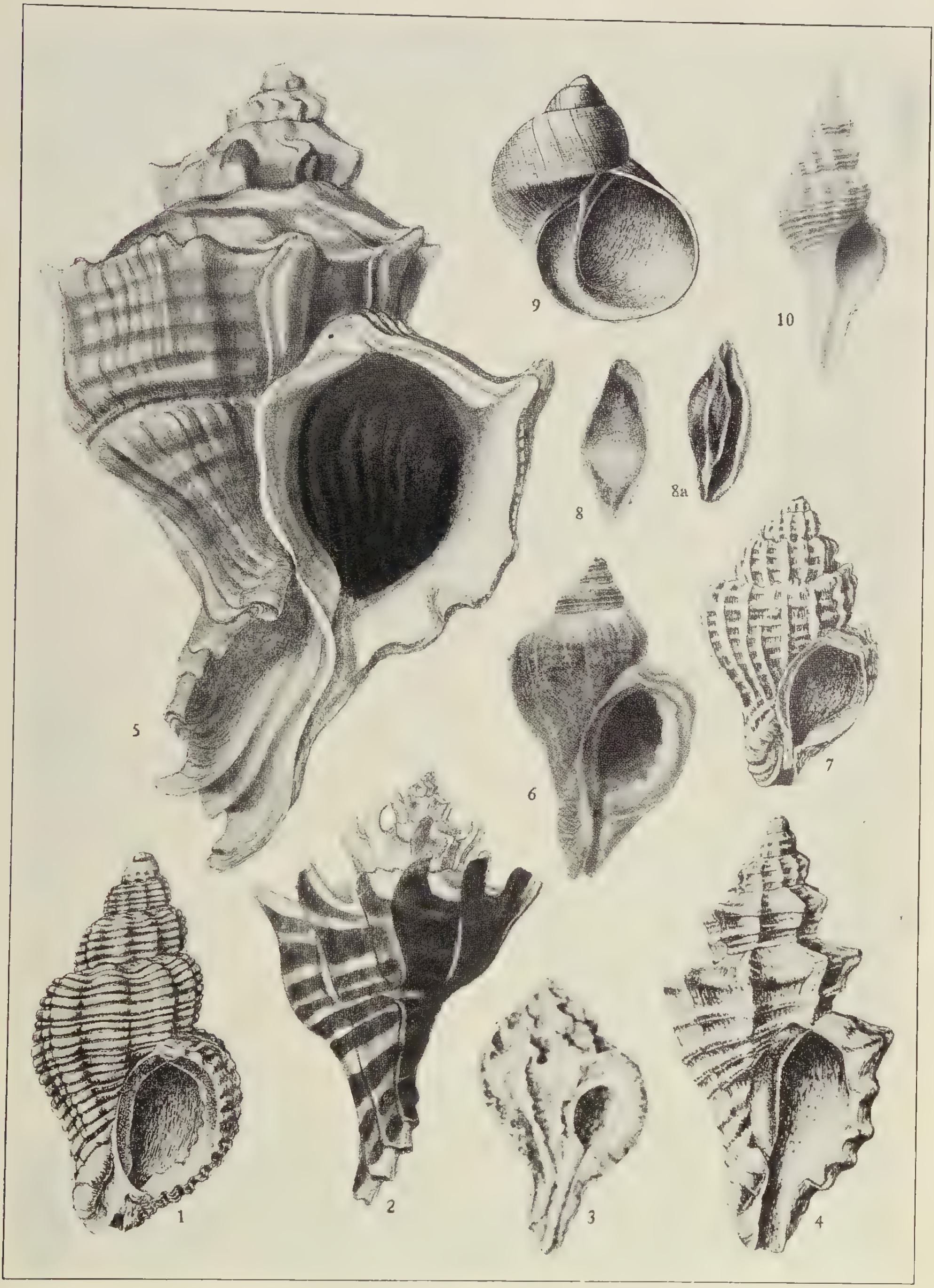


Plate 33

This plate from United States National Museum except figures 7, 8, refigured type figures, from American Museum of Natural History, and 12, from *Marine Shells of Puget Sound and Vicinity.*

FIGURE		PAGE
1, 2, 3.	*Seguenzia giovia* Dall	245
4, 5, 6.	*Seguenzia caliana* Dall	244
7, 8.	*Bursa californica* Hinds	241
9.	*Trophon avalonensis* Dall	34
10.	*Trophon tripherus* Dall Typical.	40
11.	*Trophon multicostatus* Eschscholtz	33
12.	*Trophon peregrinus* Dall	36
13.	*Trophon stuarti* E. A. Smith	38
14.	*Trophon smithi* Dall	38

PLATE 33

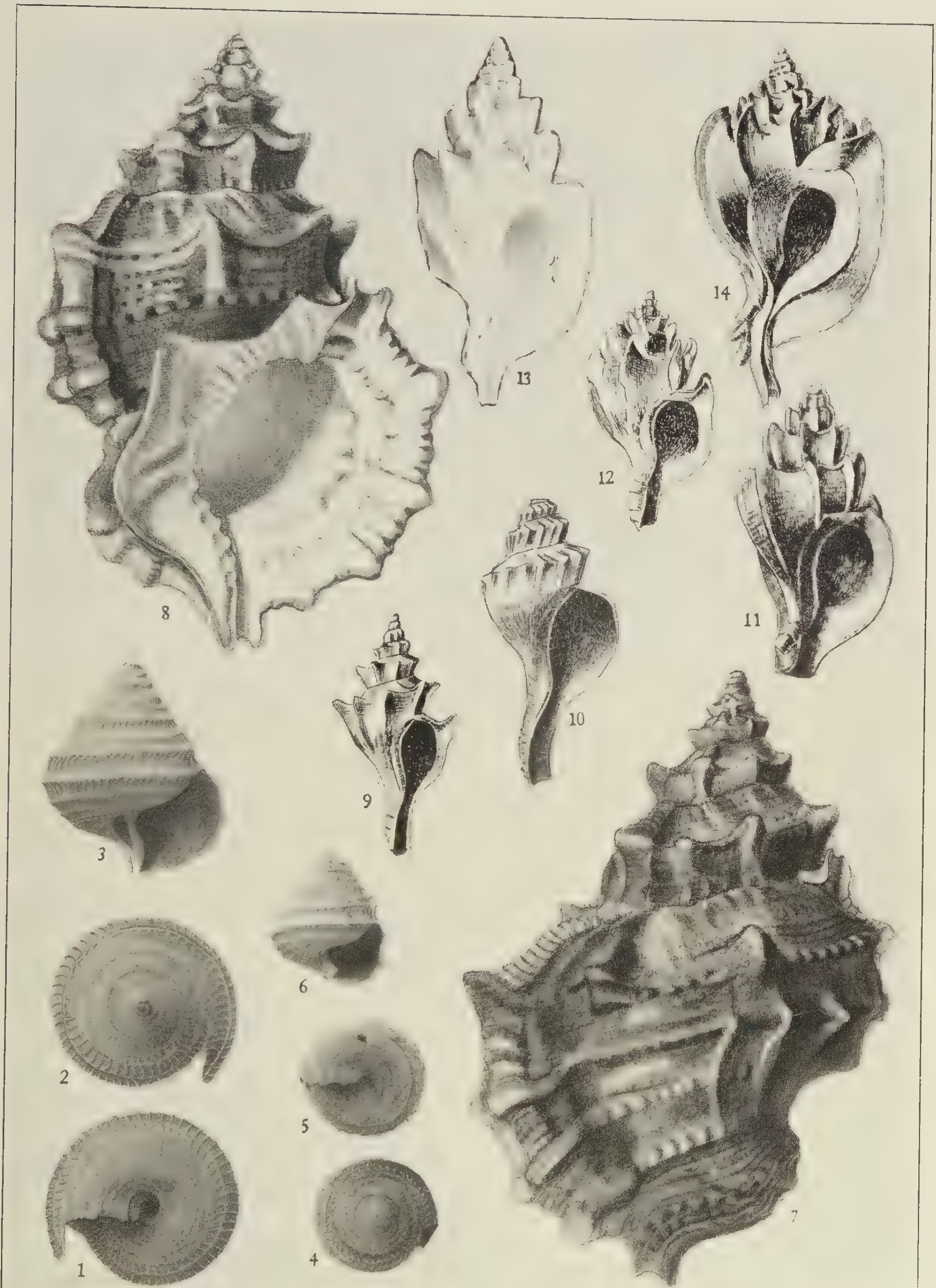
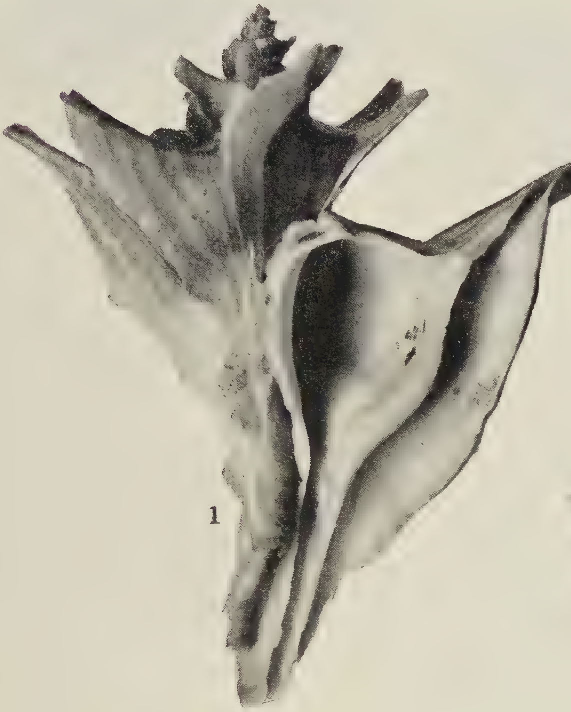


Plate 34

FIGURE		PAGE
1, 2.	*Trophon catalinensis,* n.sp. Type.	29
3, 4, 5.	*Trophon catalinensis,* n.sp. Young specimens.	29
6, 7.	*Trophon triangulatus* Carpenter Figured type specimens, magnified three times, University of California.	28

Plate 34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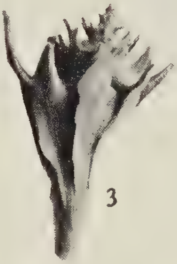
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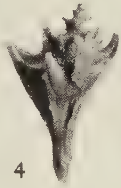
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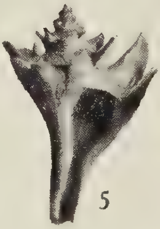
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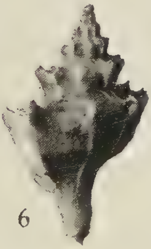
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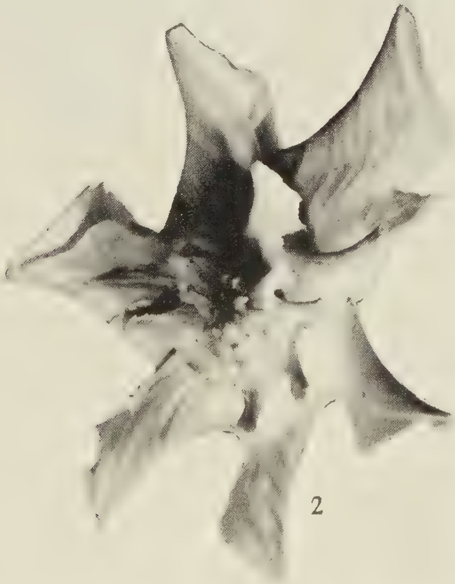
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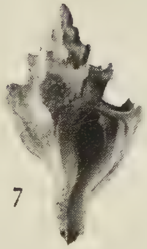
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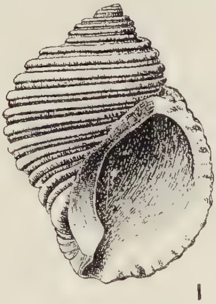
Plate 35

This plate from *Proceedings of the United States National Museum,* **49.**

FIGURE		PAGE
1.	*Thais canaliculata analoga* Forbes	46
2.	*Thais canaliculata compressa* Dall	47
3.	*Thais canaliculata* Duclos Typical.	46
4.	*Thais canaliculata* Duclos	46
5.	*Thais lamellosa cymica* Dall	43
6.	*Thais lamellosa franciscana* Dall	43
7.	*Thais lamellosa* Gmelin	42
8.	*Thais lamellosa hormica* Dall	43

Plate 35



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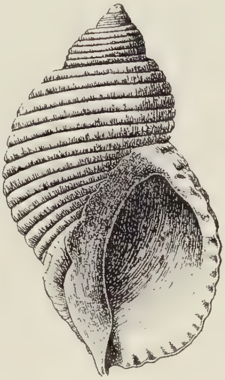

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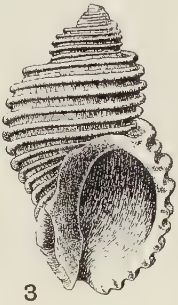

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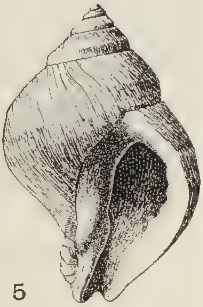

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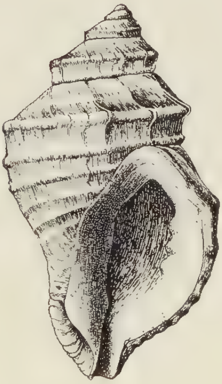

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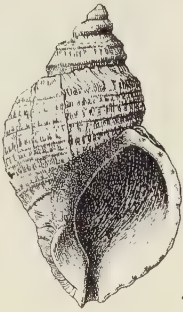

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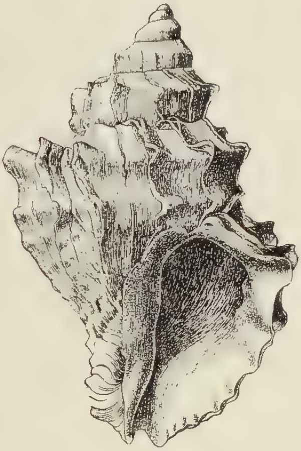

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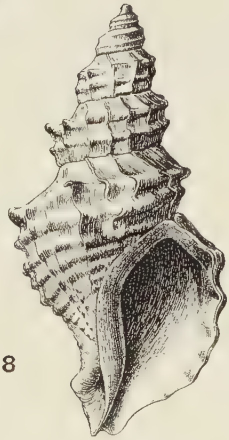

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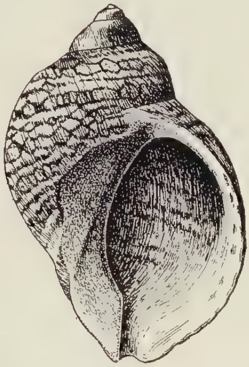
PLATE 36

This plate from *Proceedings of the United States National Museum,* 49.

FIGURE	PAGE
1. *Thais emarginata ostrina* Gould	45
2. *Thais emarginata* Deshayes Typical.	44
3. *Thais emarginata* Deshayes	44
4. *Thais lima* Martyn Typical.	44
5. *Thais lima* Martyn	44
6. *Thais lima* Martyn	44

Plate 36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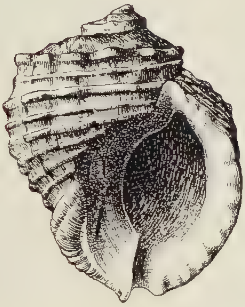
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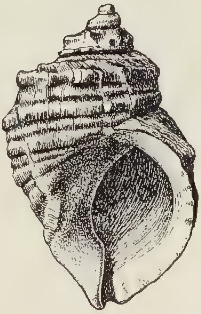
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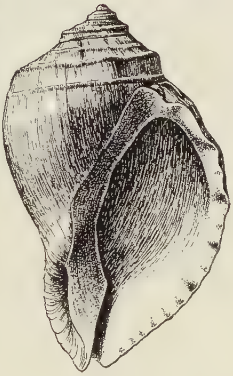
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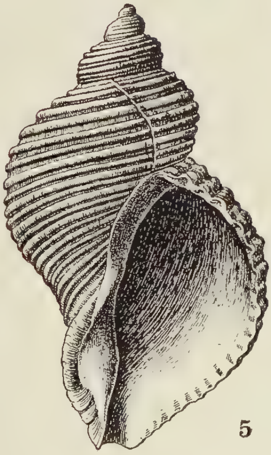
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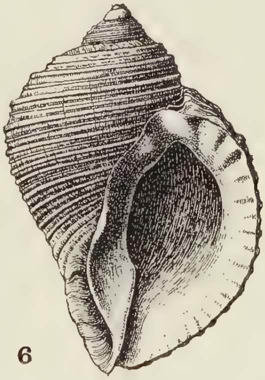
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Plate 37

This plate from *Marine Shells of Puget Sound and Vicinity.*

FIGURE		PAGE
1, 2, 3.	*Argobuccinum oregonensis* Redfield	242
4, 5.	*Thais emarginata projecta* Dall	45

Plate 37

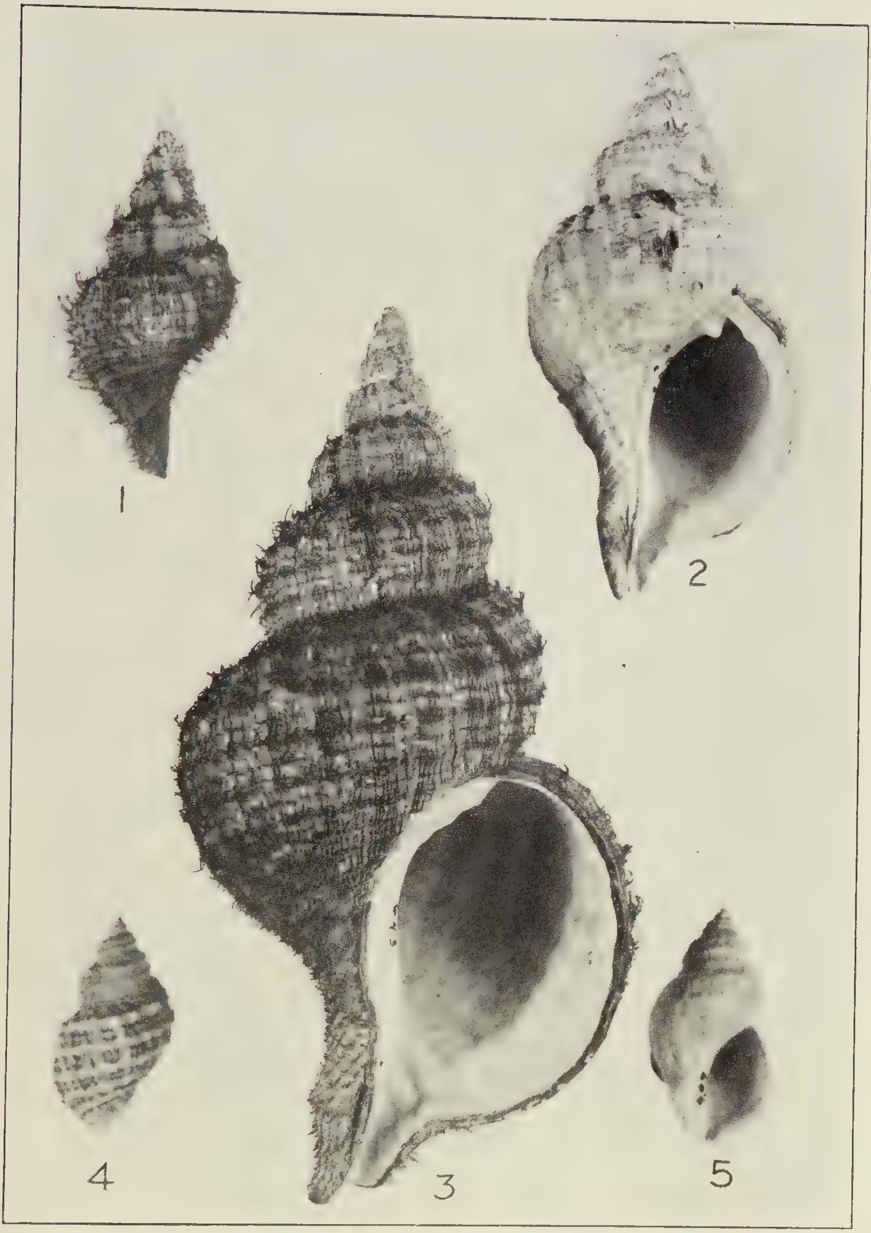


Plate 38

FIGURE		PAGE
1.	*Thais lamellosa* Gmelin	42
2.	*Thais lamellosa* Gmelin	42
3.	*Thais lamellosa hormica* Dall	43
4.	*Thais lamellosa* Gmelin	42
5.	*Thais lamellosa hormica* Dall	43

PLATE 38

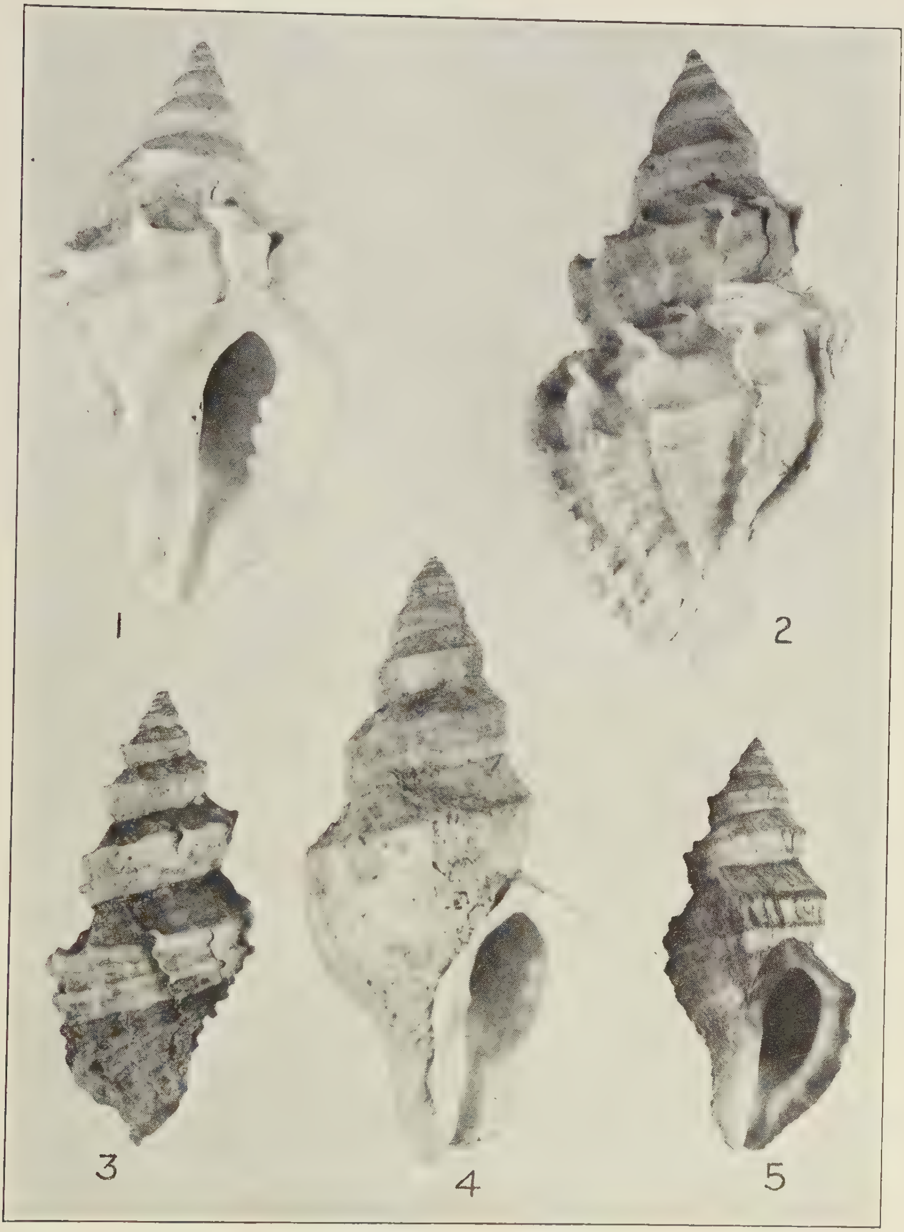
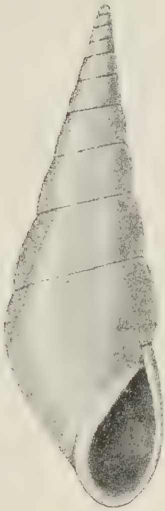


Plate 39

This plate from *Proceedings of the United States National Museum*, **53.**

FIGURE	PAGE
1. *Melanella elodia* de Folin Type.	Not in text
2. *Melanella draconis* Bartsch Type, fossil.	Not in text
3. *Melanella recta* C. B. Adams Type.	Not in text
4. *Melanella peninsularis* Bartsch Type.	69
5. *Melanella producta* Carpenter Type.	Not in text
6. *Melanella montereyensis* Bartsch Type.	69

PLATE 39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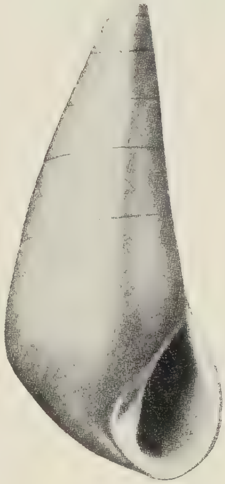
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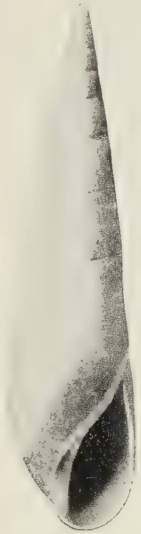
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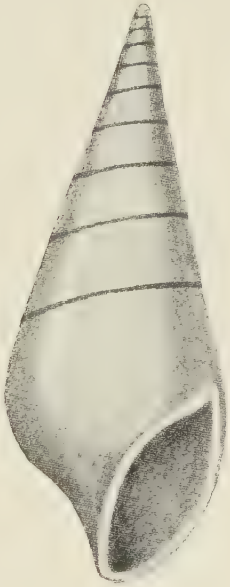
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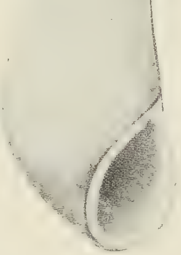
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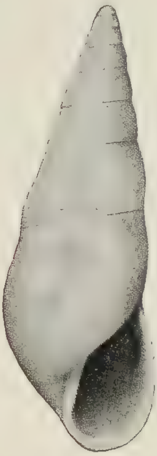
Plate 40

This plate from *Proceedings of the United States National Museum,* **53.**

FIGURE		PAGE
1.	*Melanella californica* Bartsch Type.	76
2.	*Melanella baldra* Bartsch Type.	Not in text
3.	*Melanella compacta* Carpenter Type.	77
4.	*Melanella randolphi* Vanatta Type.	76
5.	*Melanella mexicana* Bartsch Type.	Not in text
6.	*Melanella hemphilli* Bartsch Type.	77

Plate 40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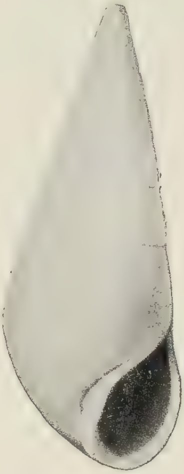
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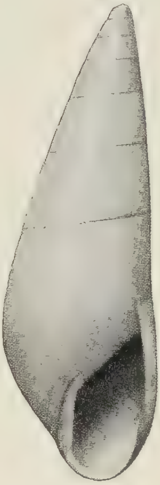
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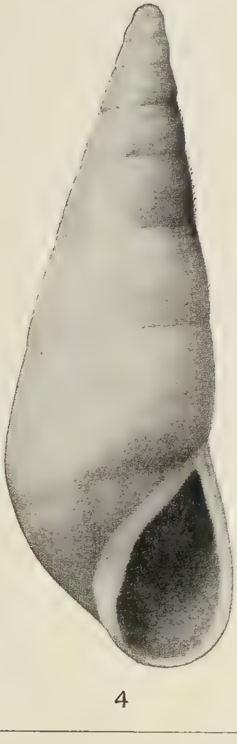
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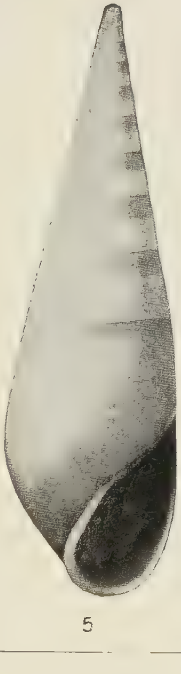
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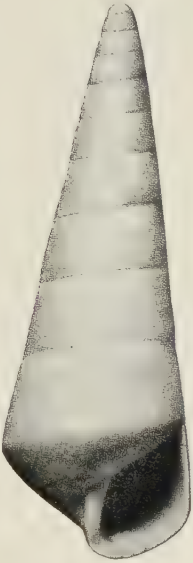
Plate 41

This plate from *Proceedings of the United States National Museum,* **53.**

FIGURE	PAGE
1. *Melanella panamaensi* Bartsch Type.	Not in text
2. *Melanella monicensis* Bartsch Type, fossil.	Not in text
3. *Melanella necropolitana* Bartsch Type, fossil.	Not in text
4. *Melanella linearis* Carpenter	Not in text
5. *Melanella oldroydi* Bartsch Fossil.	76
6. *Melanella oldroydi* Bartsch Type.	76
7. *Melanella oldroydi* Bartsch Fossil.	76

PLATE 41

1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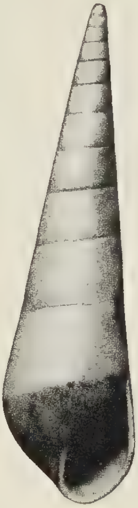
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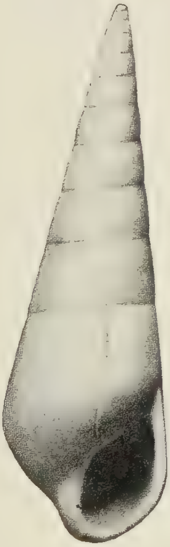
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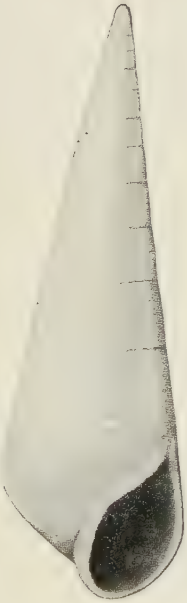
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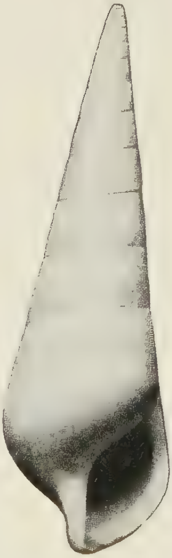
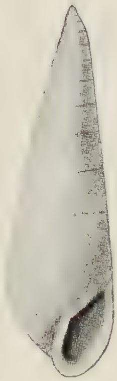

7

Plate 42

This plate from *Proceedings of the United States National Museum,* **53.**

FIGURE		PAGE
1.	*Melanella townsendi* Bartsch Type.	Not in text
2.	*Melanella halia* Bartsch Type.	Not in text
3.	*Melanella lastra* Bartsch Type.	70
4.	*Melanella abreojosensis* Bartsch Type.	Not in text
5.	*Melanella iota* C. B. Adams Type.	Not in text
6.	*Melanella cosmia* Bartsch Type.	Not in text
7.	*Melanella catalinensis* Bartsch Type.	73
8.	*Melanella arnoldi* Bartsch Type.	Not in text
9.	*Melanella yod* Carpenter Type.	Not in text

PLATE 42



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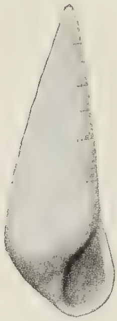

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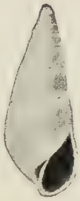

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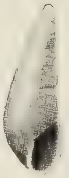

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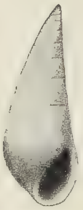

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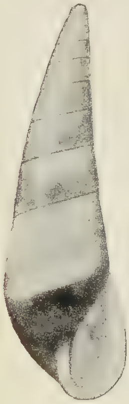

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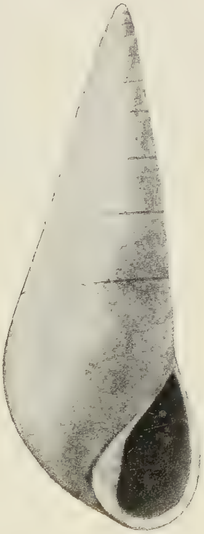

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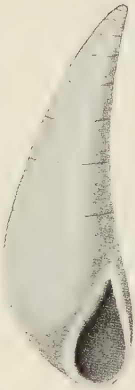


9

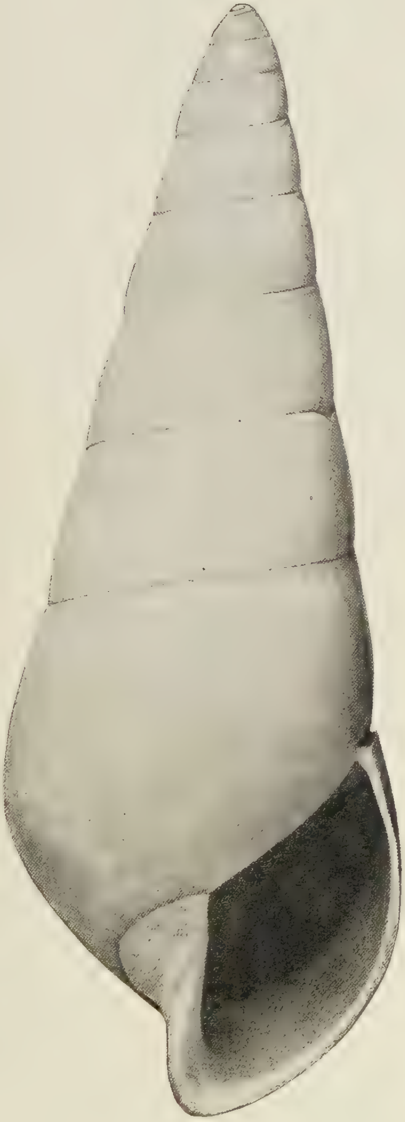
Plate 43

This plate from *Proceedings of the United States National Museum*, **53.**

FIGURE	PAGE
1. *Haliella lomana* Dall Type.	81
2. *Melanella ptilocrinicola* Bartsch Type.	79

Both figures enlarged.

Plate 43



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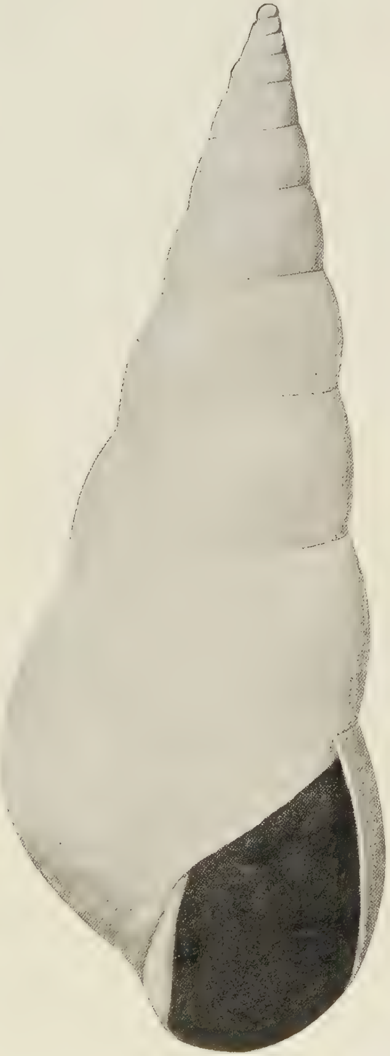


2

Plate 44

This plate from *Proceedings of the United States National Museum,* **32.**

FIGURE		PAGE
1.	*Melanella ptilocrinicola* Bartsch Off British Columbia in 1,588 fathoms.	79

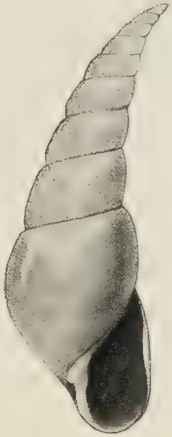
PLATE 44

Plate 45

This plate from *Proceedings of the United States National Museum,* **53.**

FIGURE	PAGE
1. *Melanella adamantina* de Folin Type.	Not in text
2. *Melanella taravali* Bartsch Type.	Not in text
3. *Melanella berryi* Bartsch Type.	72
4. *Melanella prefalcata* Bartsch Type.	Not in text
5. *Melanella grippi* Bartsch Type.	73
6. *Melanella falcata* Carpenter Type.	Not in text

PLATE 45



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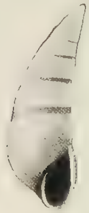

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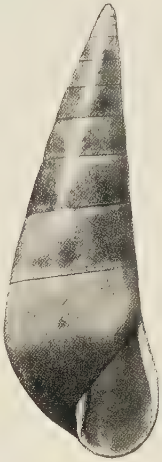

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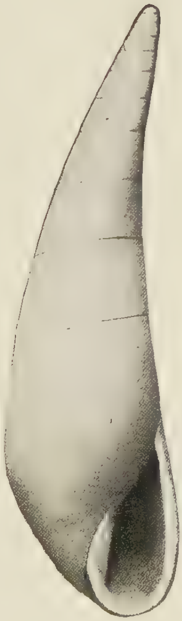

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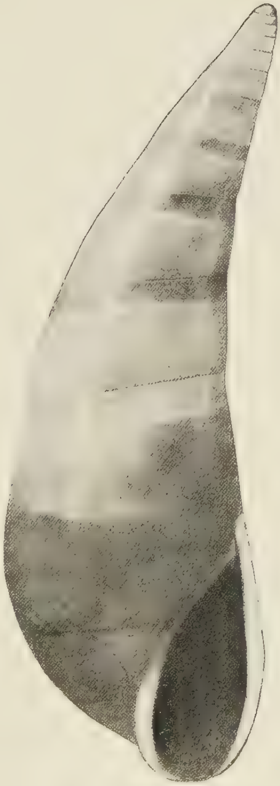

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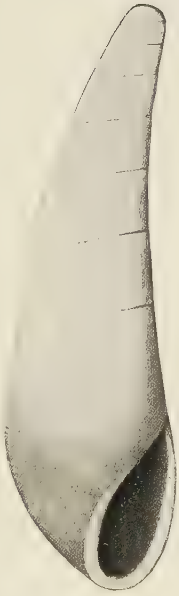


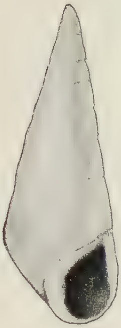
6

Plate 46

This plate from *Proceedings of the United States National Museum,* **53.**

FIGURE	PAGE
1. *Melanella oschneri* Bartsch	Not in text
2. *Melanella rutila* Carpenter Type.	75
3. *Melanella rutila* Carpenter Fossil.	75
4. *Melanella solitaria* C. B. Adams Type.	Not in text
5. *Melanella dalli* Bartsch Type.	Not in text
6. *Melanella rutila* Carpenter Fossil.	75
7. *Melanella micans borealis* Bartsch Type.	75

PLATE 46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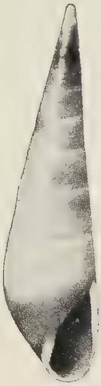
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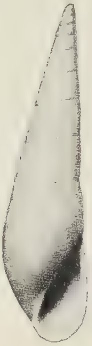
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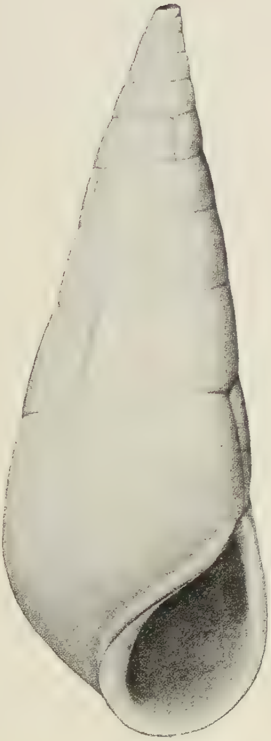
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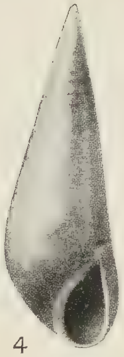
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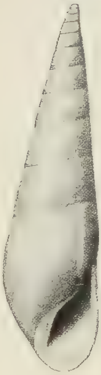
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7

PLATE 47

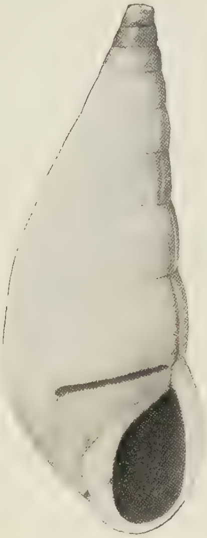
This plate from *Proceedings of the United States National Museum,* **53.**

FIGURE	PAGE
1. *Melanella lowei* Vanatta Type.	Not in text
2. *Melanella thersites* Carpenter Type.	70
3. *Melanella bistorta* Vanatta Type.	Not in text
4. *Melanella comoxensis* Bartsch Type.	71
5. *Melanella columbiana* Bartsch Type.	71
6. *Melanella macra* Bartsch Type.	72

Plate 47

1

2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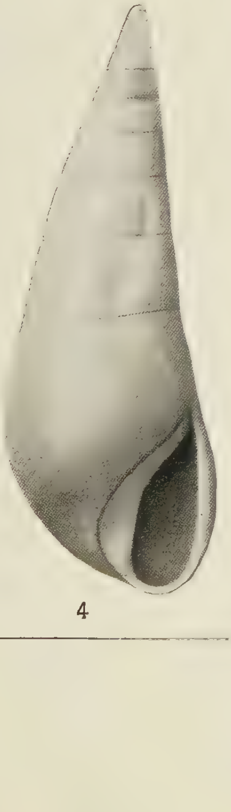
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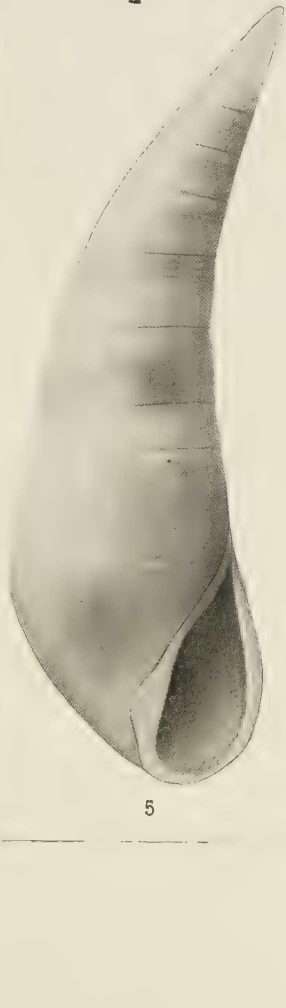
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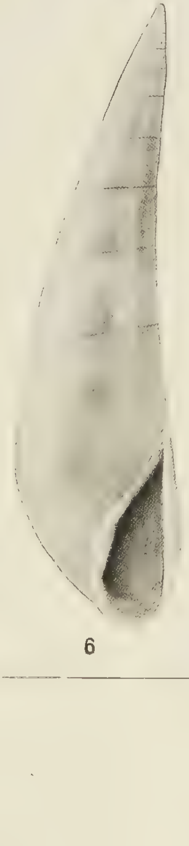
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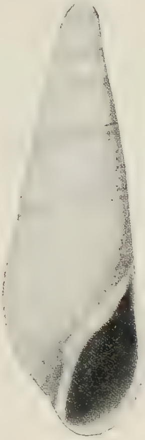
Plate 48

This plate from *Proceedings of the United States National Museum,* **53.**

FIGURE	PAGE
1. *Strombiformis alaskensis* Bartsch Type.	82
2. *Strombiformis babylonia* Bartsch Type.	Not in text
3. *Strombiformis riversi* Bartsch Type.	Not in text
4. *Strombiformis rangii* de Folin Type.	Not in text
5. *Strombiformis californicus* Bartsch Type.	82

PLATE 48



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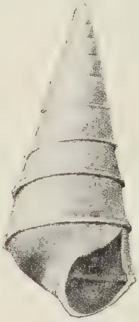

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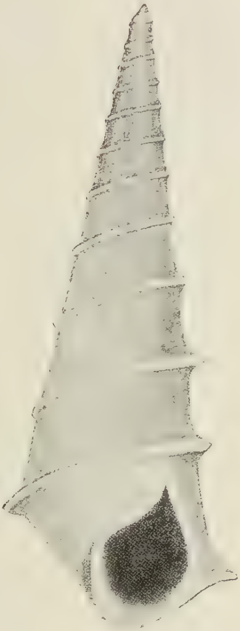

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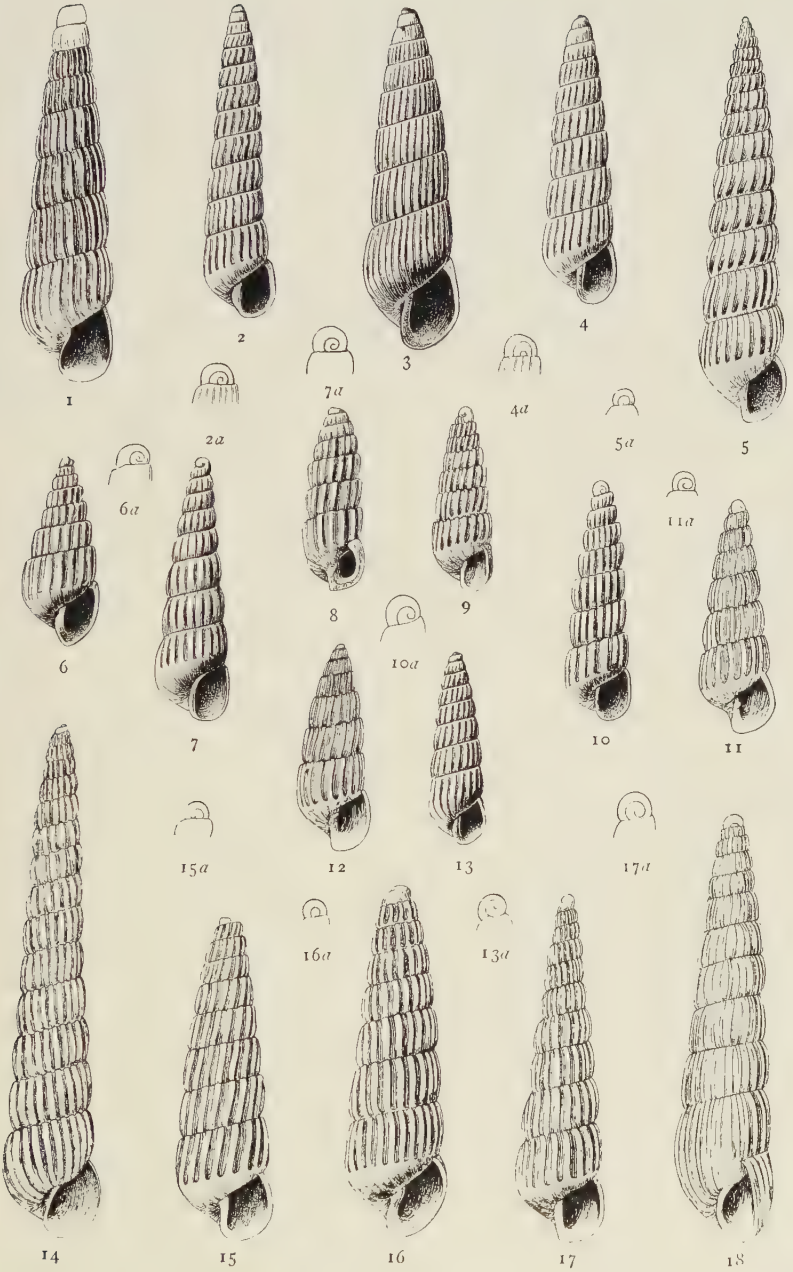
5

PLATE 49

This plate from United States National Museum, *Bulletin 68.*

FIGURE		PAGE
1.	*Turbonilla ima* Dall and Bartsch Type, Panama.	Not in text
2.	*Turbonilla aculeus* C. B. Adams Type, Panama.	Not in text
2*a*.	Nucleus of same, lateral view, much enlarged	Not in text
3.	*Turbonilla lucana* Dall Type, Cape San Lucas.	Not in text
4.	*Turbonilla paramoea* Dall and Bartsch Type, Panama.	Not in text
4*a*.	Nucleus of same, lateral view, much enlarged	Not in text
5.	*Turbonilla hypolispa* Dall and Bartsch Cotype.	89
5*a*.	Nucleus of same, lateral view, much enlarged	89
6.	*Turbonilla centrota* Dall and Bartsch Type, Panama.	Not in text
6*a*.	Nucleus of same, lateral view, much enlarged	Not in text
7.	*Turbonilla santarosana* Dall and Bartsch Type.	91
7*a*.	Nucleus of same, lateral view, much enlarged	91
8.	*Turbonilla gilli* Dall and Bartsch Type.	87
9.	*Turbonilla muricata* Carpenter Type, Mazatlan.	94
10.	*Turbonilla aepynota* Dall and Bartsch Type.	90
10*a*.	Nucleus of same, lateral view, much enlarged	90
11.	*Turbonilla muricatoides* Dall and Bartsch Type.	92
11*a*.	Nucleus of same, lateral view, much enlarged	92
12.	*Turbonilla gilli delmontensis* Dall and Bartsch Type.	88
13.	*Turbonilla diegensis* Dall and Bartsch Type.	89
13*a*.	Nucleus of same, lateral view, much enlarged	89
14.	*Turbonilla acra* Dall and Bartsch Type.	88
15.	*Turbonilla houseri* Dall and Bartsch Type, Galapagos Islands.	Not in text
15*a*.	Nucleus of same, lateral view, much enlarged	Not in text
16.	*Turbonilla kelseyi* Dall and Bartsch Type.	94
16*a*.	Nucleus of same, lateral view, much enlarged	94
17.	*Turbonilla raymondi* Dall and Bartsch Type.	93
17*a*.	Nucleus of same, lateral view, much enlarged	93
18.	*Turbonilla prolongata* Carpenter Type, Mazatlan. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text

Plate 49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4a
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2a
5a
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11a
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10a
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15a
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17a
16a
13a
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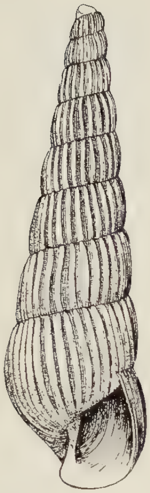
18

Plate 50

This plate from United States National Museum, *Bulletin 68.*

FIGURE		PAGE
1.	*Turbonilla keepi* Dall and Bartsch Type.	116
2.	*Turbonilla halistrepta* Dall and Bartsch Type.	117
3.	*Turbonilla victoriana* Dall and Bartsch Type.	107
4.	*Turbonilla painei* Dall and Bartsch Type.	116
4*a*.	Nucleus of same, lateral view, much enlarged	116
5.	*Turbonilla oregonensis* Dall and Bartsch Type.	118
6.	*Turbonilla obsoleta* Carpenter Type Mazatlan. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text
7.	*Turbonilla abreojensis* Dall and Bartsch Type, Lower California.	Not in text
8.	*Turbonilla lituyana* Dall and Bartsch Type.	117
9.	*Turbonilla chocolata* Carpenter	115
9*a*.	Nucleus of same, lateral view, much enlarged	115
10.	*Turbonilla halibrecta* Dall and Bartsch Type.	110
10*a*.	Nucleus of same, lateral view, much enlarged	110
11.	*Turbonilla halia* Dall and Bartsch Type.	111

Plate 50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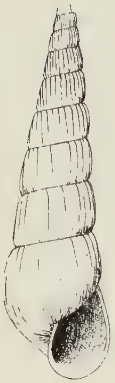
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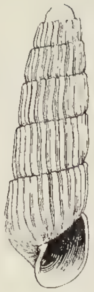
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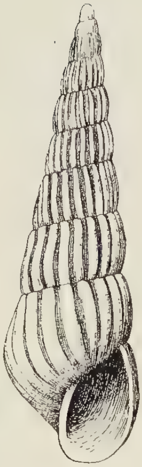
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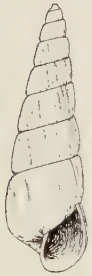
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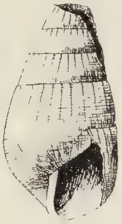
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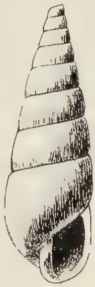
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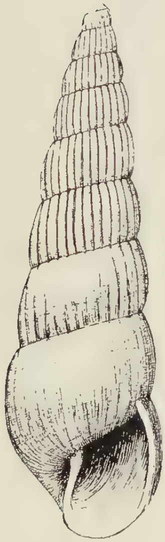
9a

10a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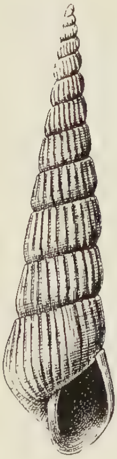
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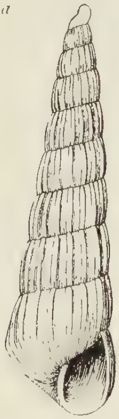
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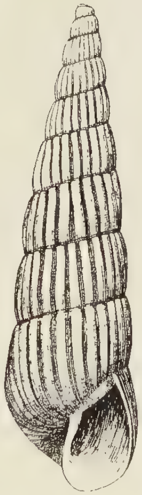
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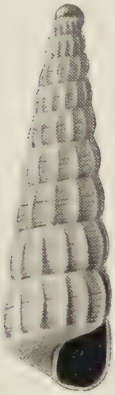
PLATE 51

This plate from *Proceedings of the United States National Museum,* **52.**

FIGURE		PAGE
1.	*Turbonilla montezuma* Bartsch	Not in text
2.	*Turbonilla santamariana* Bartsch	Not in text
3.	*Turbonilla doredona* Bartsch	106
4.	*Turbonilla pugetensis* Bartsch	113
5.	*Turbonilla guilleni* Bartsch	Not in text
6.	*Turbonilla eva* Bartsch	130
7.	*Turbonilla tremperi* Bartsch	114
8.	*Turbonilla hemphilli* Bartsch	Not in text
9.	*Turbonilla barkleyensis* Bartsch	105
10.	*Turbonilla ina* Bartsch	128
11.	*Turbonilla canadensis* Bartsch	96

PLATE 51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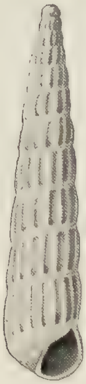
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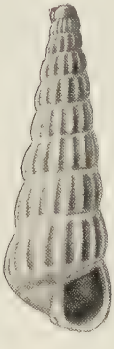
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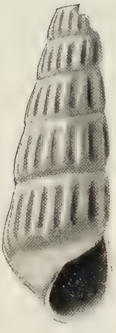
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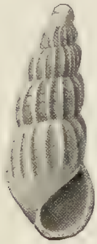
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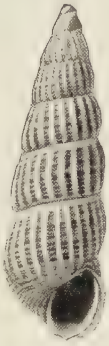
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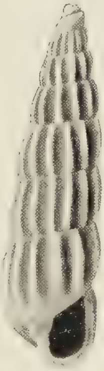
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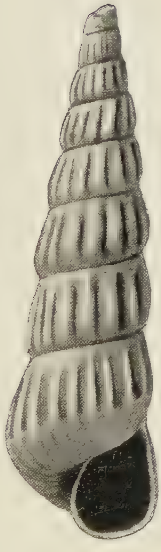
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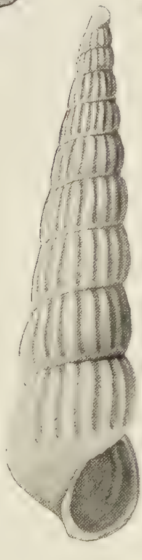
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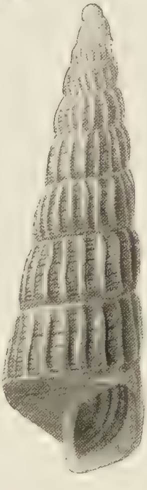
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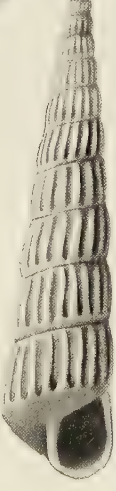
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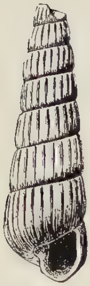
PLATE 52

This plate from United States National Museum, *Bulletin 68.*

FIGURE		PAGE
1.	*Turbonilla gouldi* Dall and Bartsch Cotype.	111
1*a*.	Nucleus of same, lateral view, much enlarged	111
2.	*Turbonilla gibbosa* Carpenter. Type, Mazatlan. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text
3.	*Turbonilla newcombei* Dall and Bartsch Type.	108
4.	*Turbonilla aurantia* Carpenter Type.	123
5.	*Turbonilla berryi* Dall and Bartsch Type.	112
5*a*.	Nucleus of same, lateral view, much enlarged	112
6.	*Turbonilla lyalli* Dall and Bartsch Type.	120
6*a*.	Nucleus of same, lateral view, much enlarged	120
7.	*Turbonilla taylori* Dall and Bartsch Cotype.	109
7*a*.	Nucleus of same, lateral view, much enlarged	109
8.	*Turbonilla valdezi* Dall and Bartsch Type.	108
9.	*Turbonilla alaskana* Dall and Bartsch Type.	114
10.	*Turbonilla ridgwayi* Dall and Bartsch Type.	107
10*a*.	Nucleus of same, lateral view, much enlarged	107
11.	*Turbonilla lowei* Dall and Bartsch Type.	112
11*a*.	Nucleus of same, lateral view, much enlarged	112
12.	*Turbonilla pedroana* Dall and Bartsch Type.	121
12*a*.	Nucleus of same, lateral view, much enlarged	121

PLATE 52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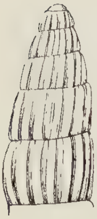
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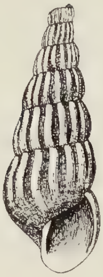
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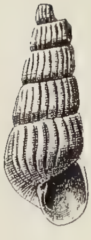
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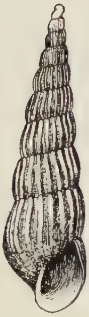
5a

1a

7a

6a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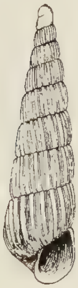
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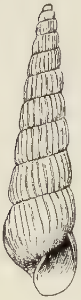
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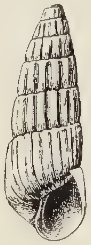
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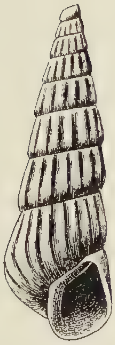
11a

10a

12a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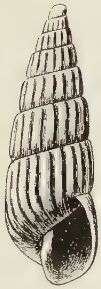
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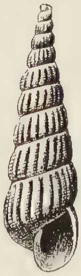
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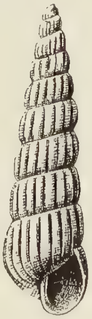

12

Plate 53

This plate from United States National Museum, *Bulletin 68*.

FIGURE		PAGE
1.	*Turbonilla castanea* Keep Type.	142
1*a*.	Nucleus of same, lateral view, much enlarged	142
2.	*Turbonilla sanctorum* Dall and Bartsch Type, La Paz.	Not in text
2*a*.	Nucleus of same, lateral view, much enlarged	Not in text
3.	*Turbonilla canfieldi* Dall and Bartsch Type.	138
3*a*.	Nucleus of same, lateral view, much enlarged	138
4.	*Turbonilla shimeki* Dall and Bartsch Type, Galapagos.	Not in text
4*a*.	Nucleus of same, lateral view, much enlarged	Not in text
5.	*Turbonilla auricoma* Dall and Bartsch Type.	141
5*a*.	Nucleus of same, lateral view, much enlarged	141
6.	*Turbonilla halidoma* Dall and Bartsch Type, La Paz.	Not in text
6*a*.	Nucleus of same, lateral view, much enlarged	Not in text
7.	*Turbonilla castanella* Dall Type.	143
8.	*Turbonilla almo* Dall and Bartsch Type.	139
8*a*.	Nucleus of same, lateral view, much enlarged	139
9.	*Turbonilla pluto* Dall and Bartsch Type.	126
10.	*Turbonilla dina* Dall and Bartsch Type, Panama.	Not in text
11.	*Turbonilla callipeptum* Dall and Bartsch Type, Panama.	Not in text
11*a*.	Nucleus of same, lateral view, much enlarged	Not in text
12.	*Turbonilla aragoni* Dall and Bartsch Type.	132
12*a*.	Nucleus of same, lateral view, much enlarged	132

PLATE 53

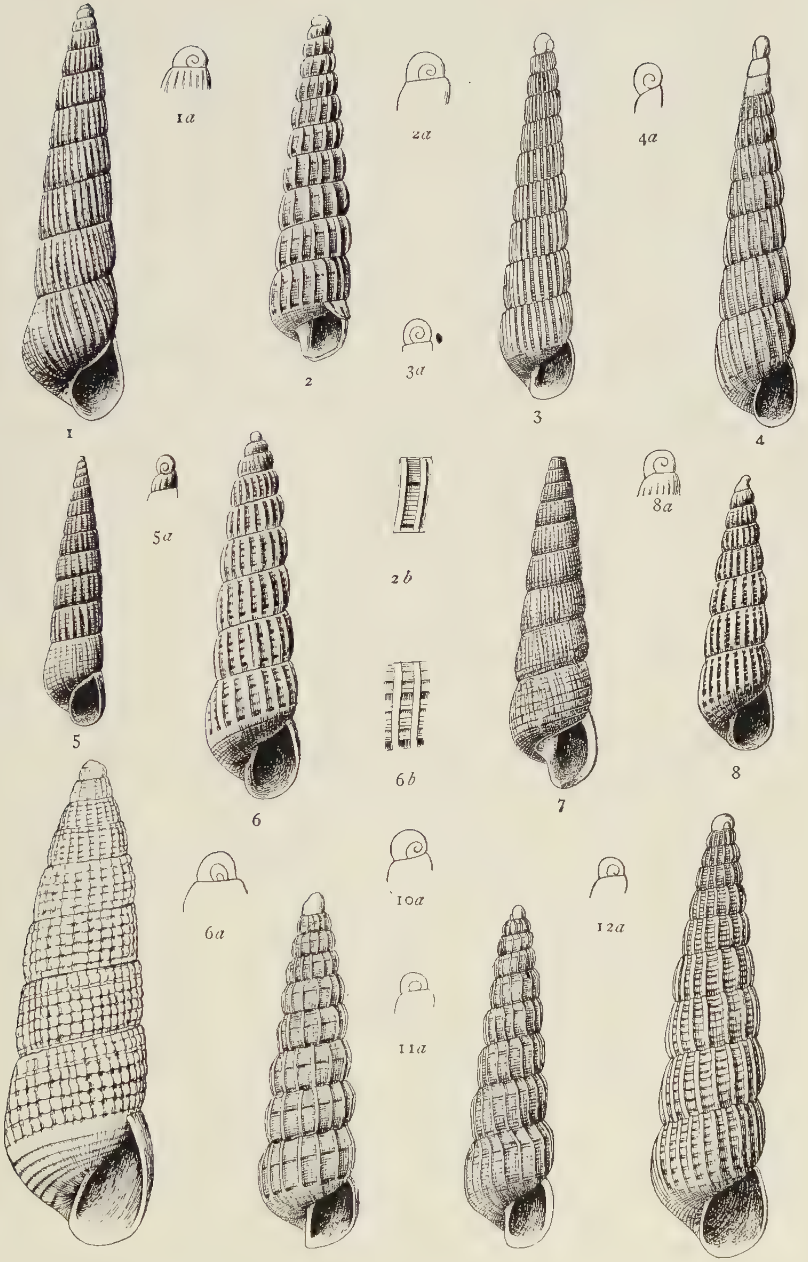
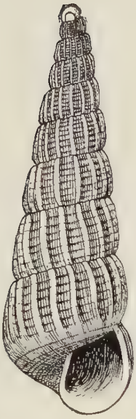


PLATE 54

This plate from *Proceedings of the United States National Museum*, **33.**

FIGURE		PAGE
1.	*Turbonilla mörchi* Dall and Bartsch Type.	131
1*a*.	Nucleus of same, lateral view, much enlarged	131
2.	*Turbonilla oregonensis* Dall and Bartsch Type.	118
3.	*Turbonilla tenuicula* Gould	136
3*a*.	Nucleus of same, lateral view, much enlarged	136
4.	*Turbonilla antestriata* Dall and Bartsch Type.	134
4*a*.	Nucleus of same, lateral view, much enlarged	134
5.	*Turbonilla aurantia* Carpenter Type.	123
6.	*Turbonilla newcombei* Dall and Bartsch Type.	108
7.	*Turbonilla lordi* E. A. Smith	149
7*a*.	Nucleus of same, lateral view, much enlarged	149
8.	*Turbonilla eucosmobasis* Dall and Bartsch Type.	140
8*a*.	Nucleus of same, lateral view, much enlarged	140
9.	*Turbonilla tridentata* Carpenter	147
10.	*Turbonilla eschscholtzi* Dall and Bartsch Type.	145

PLATE 54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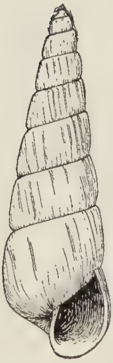
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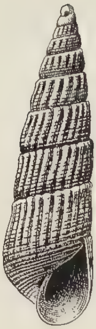
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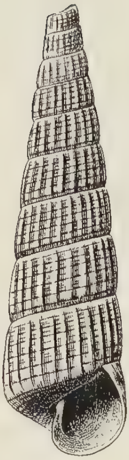
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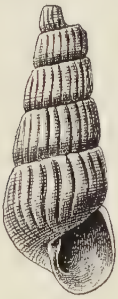
3a

1a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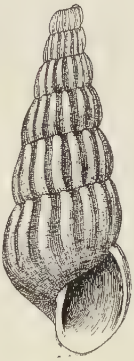
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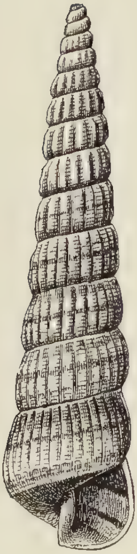
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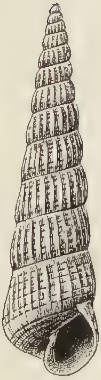
7a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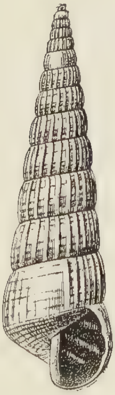
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8a

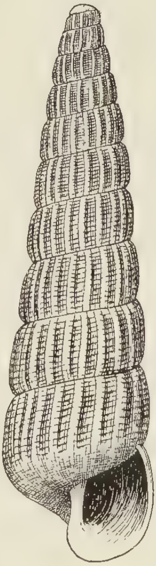
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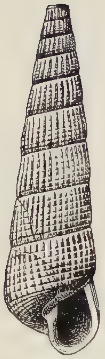
Plate 55

This plate from United States National Museum, *Bulletin 68.*

FIGURE		PAGE
1.	*Turbonilla signae* Dall and Bartsch Type.	130
2.	*Turbonilla jewetti* Dall and Bartsch Type.	126
2*a*.	Nucleus of same, lateral view, much enlarged	126
3.	*Turbonilla obesa* Dall and Bartsch Type.	124
3*a*.	Nucleus of same, lateral view, much enlarged	124
4.	*Turbonilla callia* Dall and Bartsch Type.	125
5.	*Turbonilla pequensis* Dall and Bartsch Type, Lower California.	Not in text
5*a*.	Nucleus of same, lateral view, much enlarged	Not in text
6.	*Turbonilla mörchi* Dall and Bartsch Type.	131
6*a*.	Nucleus of same, lateral view, much enlarged	131
7.	*Turbonilla annettae* Dall and Bartsch Type, Ecuador.	Not in text
8.	*Turbonilla striosa* C. B. Adams Type, Panama.	Not in text
8*a*.	Nucleus of same, lateral view, much enlarged	Not in text
9.	*Turbonilla gracillima* Carpenter Type, Mazatlan. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text
10.	*Turbonilla superba* Dall and Bartsch Type, La Paz.	Not in text
10*a*.	Nucleus of same, lateral view, much enlarged	Not in text
11.	*Turbonilla vexativa* Dall and Bartsch Type.	123
12.	*Turbonilla recta* Dall and Bartsch Type.	132
12*a*.	Nucleus of same, lateral view, much enlarged	132
13.	*Turbonilla nuttingi* Dall and Bartsch Type.	125
13*a*.	Nucleus of same, lateral view, much enlarged	125

PLATE 55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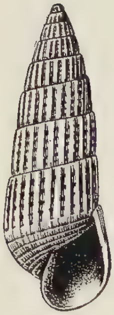
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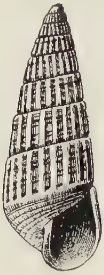
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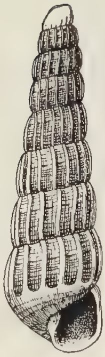
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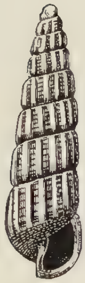
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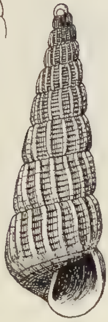
5*a*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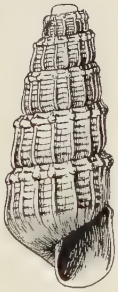
2*a*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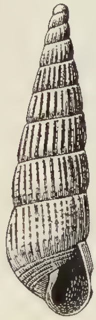
3*a*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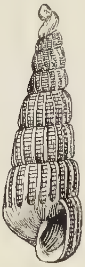
8*a*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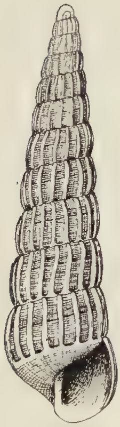
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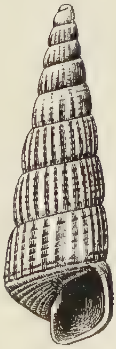
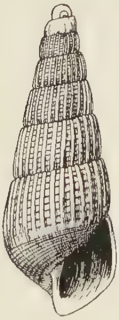
10*a*


11

6*a*

12*a*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13*a*

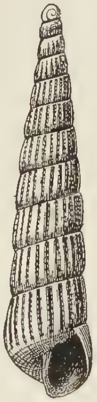

13

PLATE 56

This plate from United States National Museum, *Bulletin 68.*

FIGURE	PAGE
1. *Turbonilla regina* Dall and Bartsch Type.	144
2. *Turbonilla ignacia* Dall and Bartsch Type.	Not in text
2a. Nucleus of same, lateral view, much enlarged	Not in text
3. *Turbonilla pentalopha* Dall and Bartsch Type.	146
3a. Nucleus of same, lateral view, much enlarged	146
4. *Turbonilla lordi* E. A. Smith	149
4a. Nucleus of same, lateral view, much enlarged	149
5. *Turbonilla phalera* Dall and Bartsch Type.	Not in text
6. *Turbonilla periscelida* Dall and Bartsch Type.	150
6a. Nucleus of same, lateral view, much enlarged	150
7. *Turbonilla santarosana* Dall and Bartsch Type.	91
8. *Turbonilla eschscholtzi* Dall and Bartsch	145
9. *Turbonilla heterolopha* Dall and Bartsch Type.	149
10. *Turbonilla catalinensis* Dall and Bartsch Type.	145
10a. Nucleus of same, lateral view, much enlarged	145
11. *Turbonilla major* C. B. Adams Type.	Not in text
12. *Turbonilla tridentata* Carpenter	147
12a. Nucleus of same, lateral view, much enlarged	147
13. *Turbonilla ambusta* Dall and Bartsch Type.	148

PLATE 56

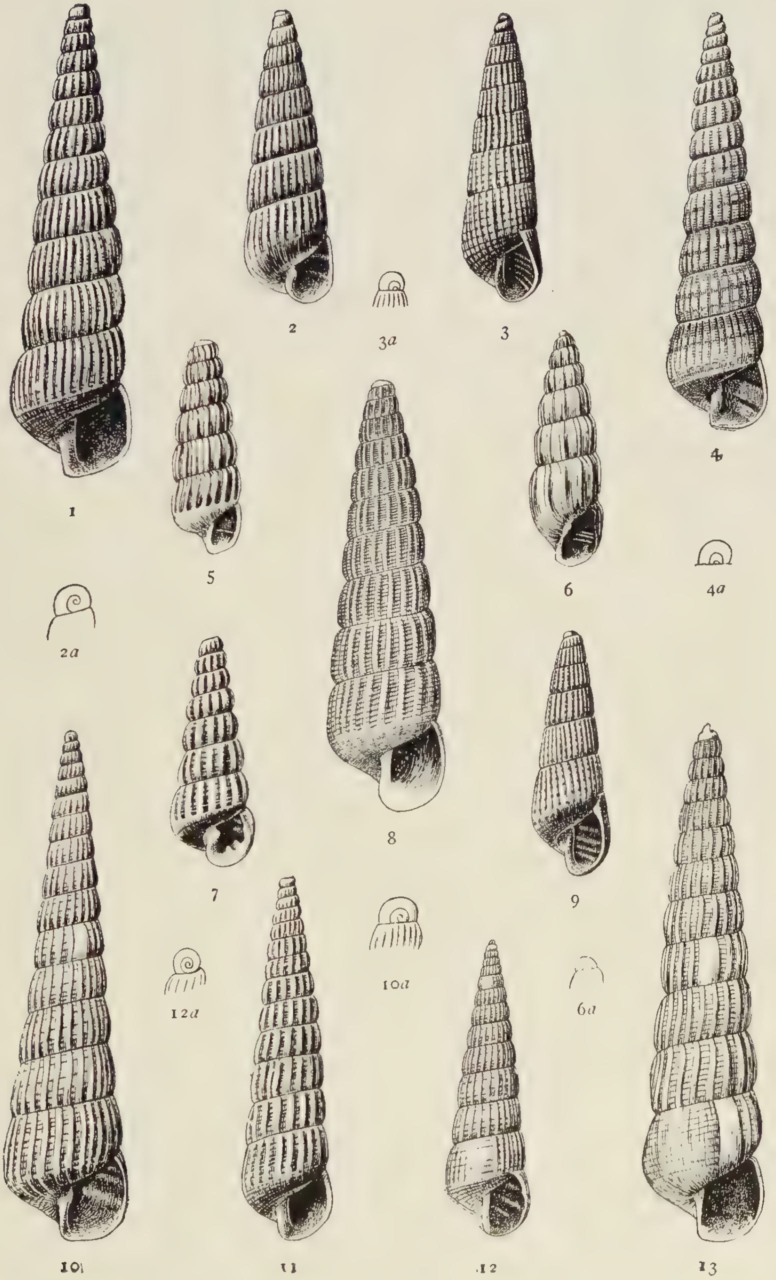
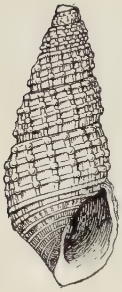


Plate 57

This plate from *Proceedings of the United States National Museum,* **33.**

FIGURE		PAGE
1.	*Odostomia astricta* Dall and Bartsch Type.	155
2.	*Odostomia navisa* Dall and Bartsch Type.	171
3.	*Odostomia navisa delmontensis* Dall and Bartsch Type.	171
3*a*.	Nucleus of same, lateral view, much enlarged	171
4.	*Odostomia montereyensis* Dall and Bartsch Type.	161
5.	*Odostomia harfordensis* Dall and Bartsch Type.	180
6.	*Odostomia exara* Dall and Bartsch Type.	177
7.	*Odostomia cooperi* Dall and Bartsch Type.	155
8.	*Odostomia phareida* Dall and Bartsch Type.	181
9.	*Odostomia amianta* Dall and Bartsch Type.	175
9*a*.	*Nucleus of* same, seen from above, much enlarged	175
10.	*Odostomia oregonensis* Dall and Bartsch Type.	163
10*a*.	Nucleus of same, lateral view, much enlarged	163

PLATE 57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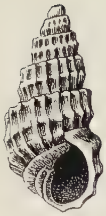
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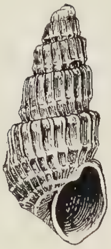
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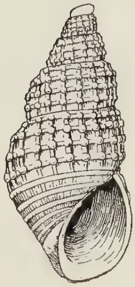
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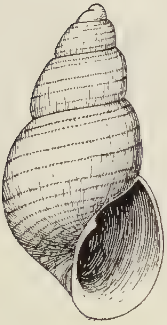
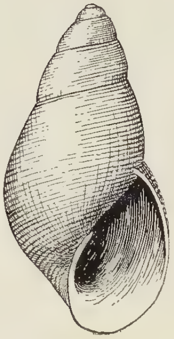

5

3a

2a

9a

10a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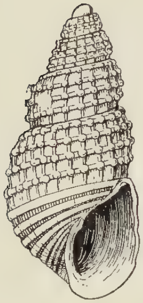
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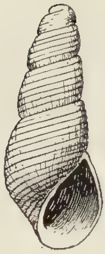
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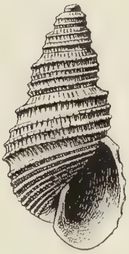
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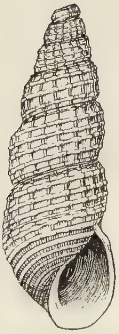
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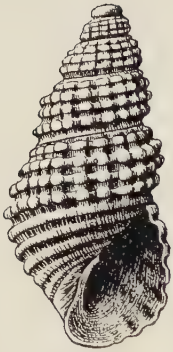
PLATE 58

This plate from United States National Museum, *Bulletin 68*.

FIGURE	PAGE
1. *Odostomia oldroydi* Dall and Bartsch Type.	162
1*a*. Nucleus of same, lateral view, much enlarged	162
2. *Odostomia cincta* Carpenter Type.	156
2*a*. Nucleus of same, lateral view, much enlarged	156
3. *Odostomia oonisca* Dall and Bartsch New name, Mazatlan, type. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text
4. *Odostomia trachis* Dall and Bartsch Type.	168
4*a*. Nucleus of same, lateral view, much enlarged	168
5. *Odostomia clementina* Dall and Bartsch Type.	157
5*a*. Nucleus of same, lateral view, much enlarged	157
6. *Odostomia rinella* Dall and Bartsch Type, Panama.	Not in text
6*a*. Nucleus of same, lateral view, much enlarged	Not in text
7. *Odostomia orata* Dall and Bartsch Type, Mazatlan. Copy of a camera lucida sketch.	Not in text
7*a*. Nucleus of same, lateral view, much enlarged	Not in text
8. *Odostomia lucca* Dall and Bartsch Type.	161
8*a*. Nucleus of same, lateral view, much enlarged	161
9. *Odostomia nodosa* Dall and Bartsch Type, Mazatlan. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text
9*a*. Nucleus of same, lateral view, much enlarged	Not in text

PLATE 58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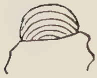
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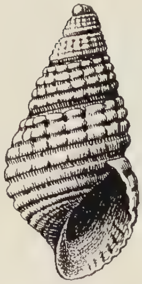
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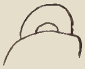
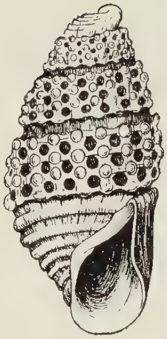

2*a*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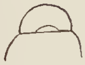
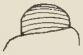
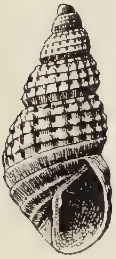

4*a*


5*a*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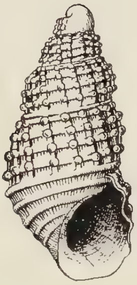
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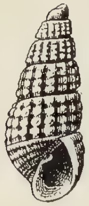
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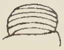
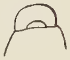

8*a*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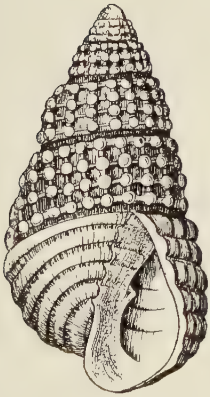
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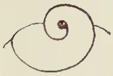
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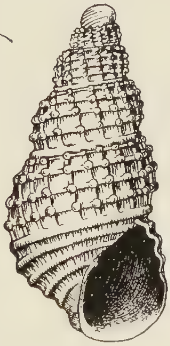
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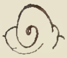
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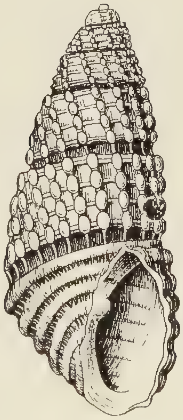
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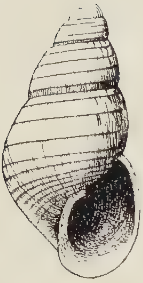
Plate 59

This plate from United States National Museum, *Bulletin 68*.

FIGURE		PAGE
1.	*Odostomia deceptrix* Bartsch Type, Lower California.	Not in text
2.	*Odostomia fasciata* Carpenter Type, Mazatlan. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text
3.	*Odostomia oregonensis* Dall and Bartsch Type.	163
4.	*Odostomia vincta* Dall and Bartsch Type.	169
5.	*Odostomia defolinia* Dall and Bartsch Type, Panama. Copy of De Folin's figure.	Not in text
6.	*Odostomia montereyensis* Dall and Bartsch Type.	161
7.	*Odostomia pulcherrima* Dall and Bartsch Type.	164
8.	*Odostomia helga* Dall and Bartsch Type.	159
8*a*.	Nucleus of same, lateral view, much enlarged	159
9.	*Odostomia fentheria* Dall and Bartsch Type, Mazatlan.	Not in text
9*a*.	Nucleus of same, lateral view, much enlarged Copy of camera lucida sketch by Dr. Carpenter.	Not in text

PLATE 59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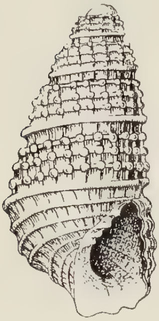
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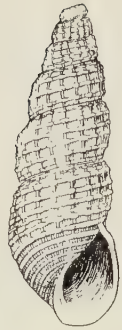
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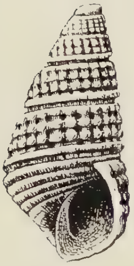
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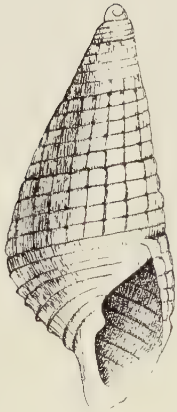
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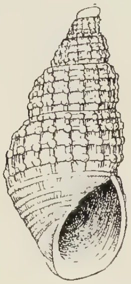
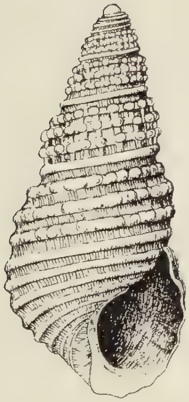

6

8a

9a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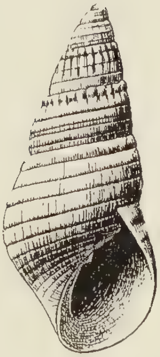
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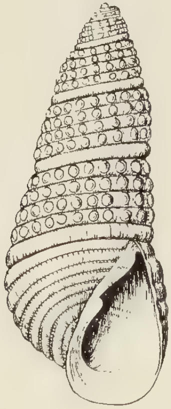
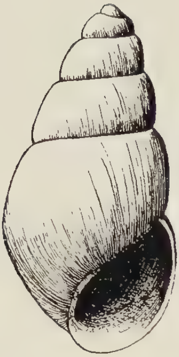

9

PLATE 60

This plate from United States National Museum, *Bulletin 68.*

FIGURE	PAGE
1. *Odostomia movilla* Dall and Bartsch Type.	198
2. *Odostomia altina* Dall and Bartsch Type.	182
3. *Odostomia baranoffensis* Dall and Bartsch Type.	185
4. *Odostomia minutissima* Dall and Bartsch Type.	197
5. *Odostomia deliciosa* Dall and Bartsch Type.	191
6. *Odostomia notilla* Dall and Bartsch Type.	199
7. *Odostomia gravida* Gould Type.	193
8. *Odostomia profundicola* Dall and Bartsch Type.	201
9. *Odostomia raymondi* Dall and Bartsch	202

Plate 60



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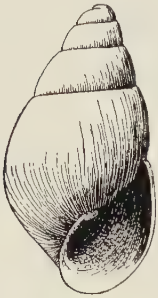

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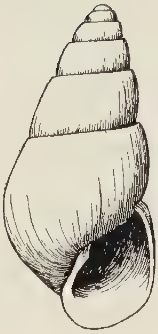

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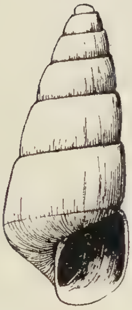

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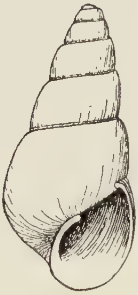

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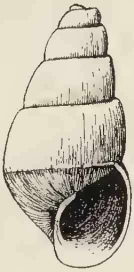

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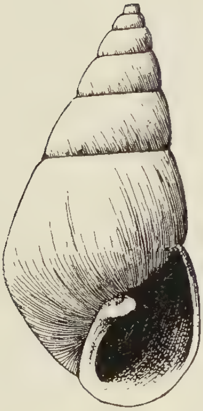

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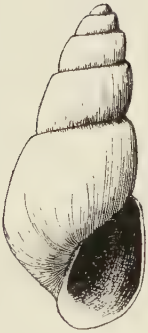

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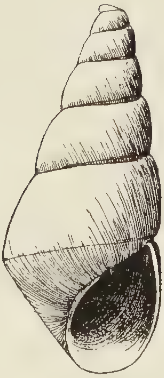

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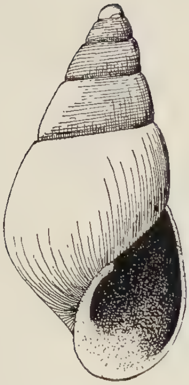
PLATE 61

This plate from *Canada Geological Survey,* Victoria Memorial Museum, *Bulletin 1.*

FIGURE	PAGE
1. *Odostomia skidegatensis* Bartsch	205
2. *Odostomia cassandra* Bartsch	188
3. *Mangilia crebricostata* Carpenter	For description, see Part I
4. *Odostomia cypria* Dall and Bartsch	190
5. *Odostomia hypatia* Dall and Bartsch	194
6. *Turbonilla hecuba* Dall and Bartsch Nova Scotia.	Not in text

Plate 61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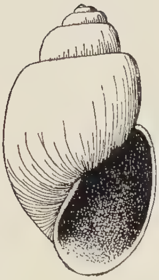
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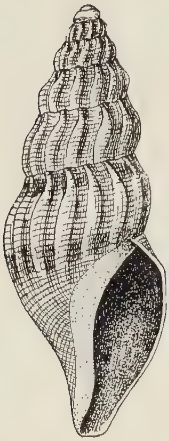
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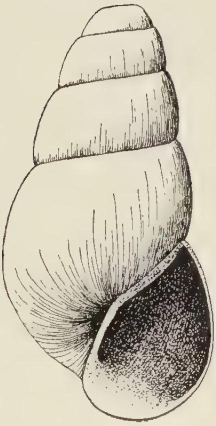
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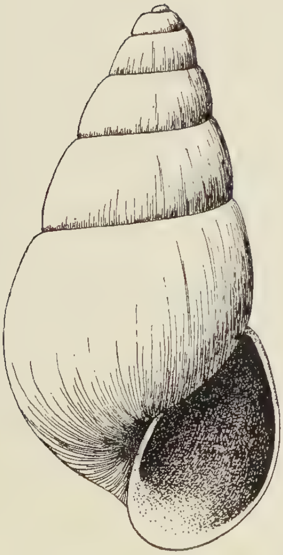
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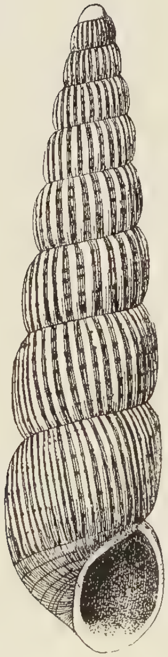
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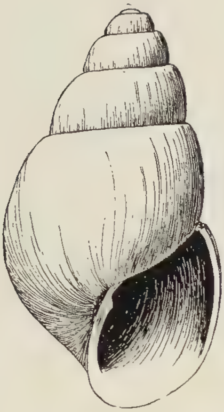
PLATE 62

This plate from United States National Museum, *Bulletin 68*.

FIGURE	PAGE
1. *Odostomia elsa* Dall and Bartsch Type.	214
2. *Odostomia pesa* Dall and Bartsch Type.	221
3. *Odostomia martensi* Dall and Bartsch Type.	218
4. *Odostomia iliuliukensis* Dall and Bartsch Type.	216
5. *Odostomia krausei* Clessin Type.	217

PLATE 62



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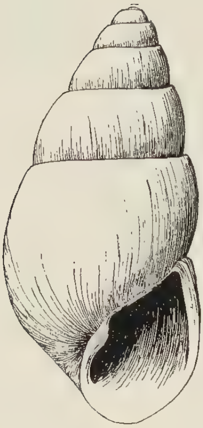

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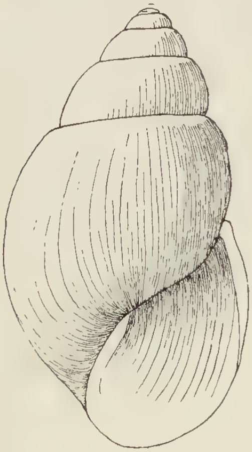

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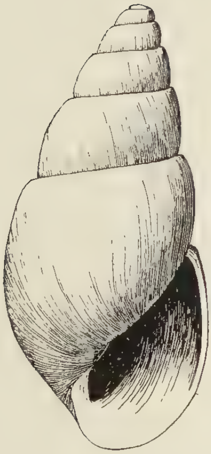

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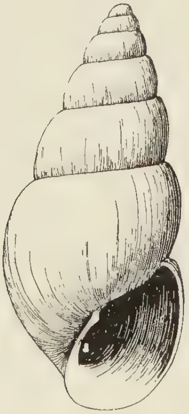

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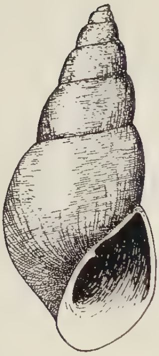
Plate 63

This plate from United States National Museum, *Bulletin 68*.

FIGURE		PAGE
1.	*Odostomia columbiana* Dall and Bartsch Type.	189
2.	*Odostomia tenuisculpta* Carpenter Type.	207
3.	*Odostomia jewetti* Dall and Bartsch Type.	196
4.	*Odostomia pratoma* Dall and Bartsch Type.	201
5.	*Odostomia phanea* Dall and Bartsch Type.	200
6.	*Odostomia valdezi* Dall and Bartsch Type.	210
7.	*Odostomia inflata* (Carpenter) Dall and Bartsch Type.	195
8.	*Odostomia herilda* Dall and Bartsch Type.	194
9.	*Odostomia phanella* Dall and Bartsch Type.	200

PLATE 63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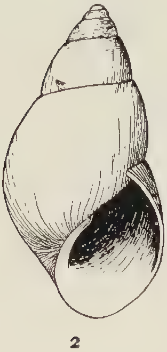
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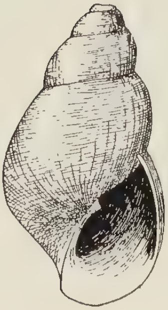
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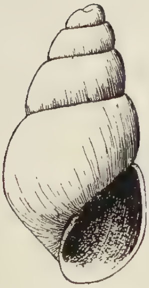
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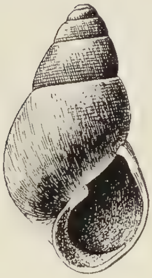
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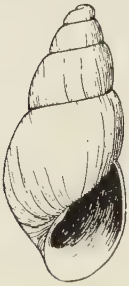
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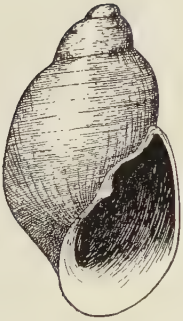
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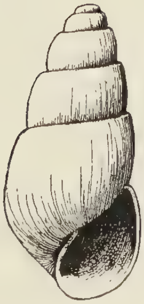
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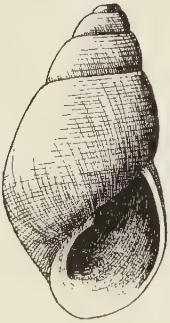
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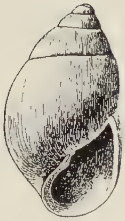
Plate 64

This plate from *Proceedings of the United States National Museum.*

FIGURE	PAGE
1. *Odostomia nuciformis* Carpenter	220
2. *Odostomia canfieldi* Dall Type.	213
3. *Odostomia avellana* Carpenter	212
4. *Odostomia subturrita* Dall and Bartsch Type.	223
5. *Odostomia arctica* Dall and Bartsch Type.	212
6. *Odostomia nota* Dall and Bartsch Type.	219
7. *Odostomia lastra* Dall and Bartsch Type.	218
8. *Odostomia kennerlyi* Dall and Bartsch Type.	217
9. *Odostomia sillana* Dall and Bartsch Type.	222

Plate 64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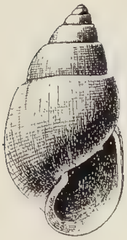
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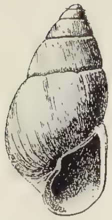
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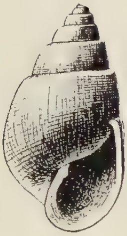
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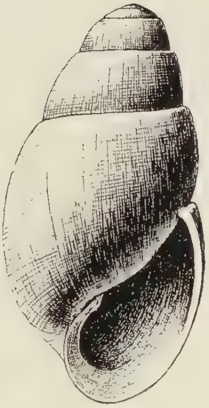
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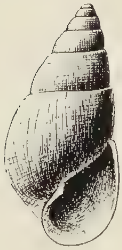
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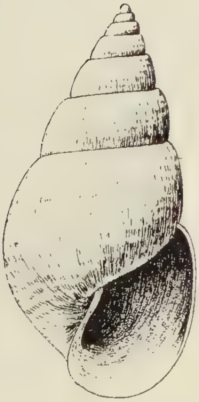
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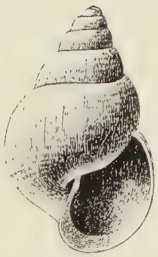
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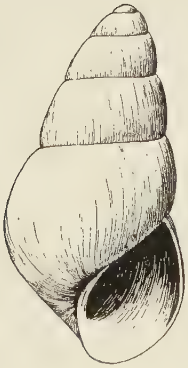
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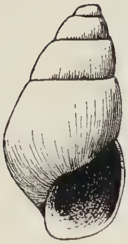
Plate 65

This plate from *Proceedings of the United States National Museum.*

FIGURE		PAGE
1.	*Odostomia dinella* Dall and Bartsch Type.	226
2.	*Odostomia rangi* De Folin Type, Panama.	Not in text
3.	*Odostomia coronadoënsis* Dall and Bartsch Type.	225
4.	*Odostomia farella* Dall and Bartsch Type.	226
5.	*Odostomia dotella* Dall and Bartsch Type, La Paz.	Not in text
6.	*Odostomia panamensis* Clessin Type, Panama.	Not in text
7.	*Odostomia moratora* Dall and Bartsch Type.	219
8.	*Odostomia mamillata* Carpenter Type, Mazatlan. Copy of a camera lucida sketch by Dr. Carpenter.	Not in text

Plate 65



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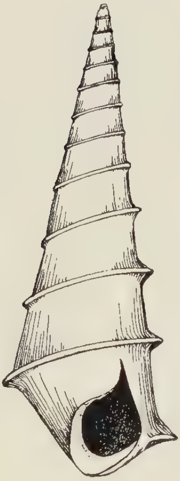

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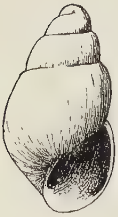

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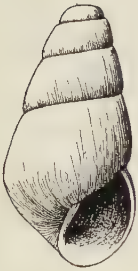

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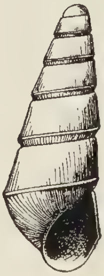

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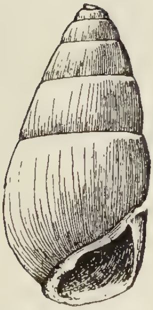

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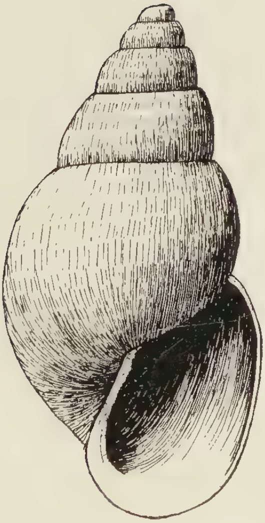

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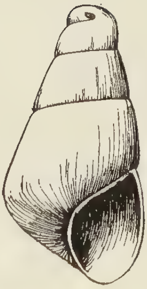

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Plate 66

This plate from *Proceedings of the United States National Museum,* **33.**

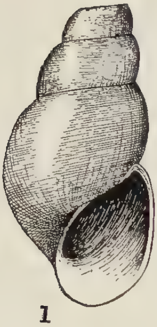
FIGURE — PAGE

1. *Odostomia tillamookensis* Dall and Bartsch 209
   Type: New species.
2. *Odostomia angularis* Dall and Bartsch 183
   Type: New species.
3. *Odostomia jewetti* Dall and Bartsch 196
   Type: New species.
4. *Turbonilla canfieldi* Dall and Bartsch 138
   Type: New species.

4*a*. Nucleus of same, lateral view, much enlarged 138

5. *Odostomia deliciosa* Dall and Bartsch 191
   Type: New species.
6. *Odostomia tenuisculpta* Carpenter 207
7. *Turbonilla castanea* 142
   Type: New species.
8. *Odostomia inflata* (Carpenter) Dall and Bartsch 195, 196
   Type.
9. *Odostomia columbiana* Dall and Bartsch 189
   Type: New species.
10. *Odostomia tacomaënsis* Dall and Bartsch 207
    Type: New species.

Plate 66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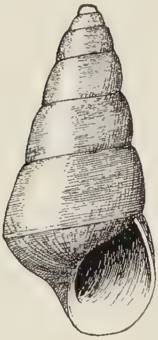
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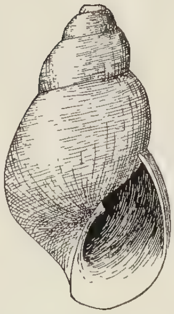
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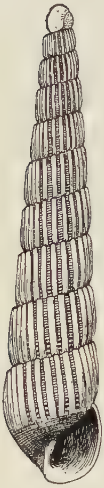
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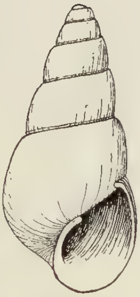
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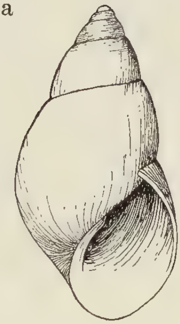
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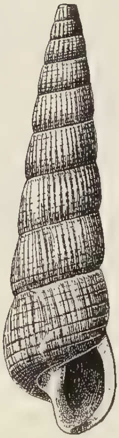
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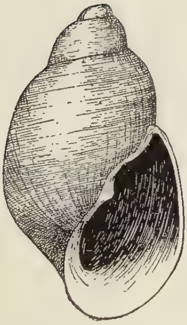
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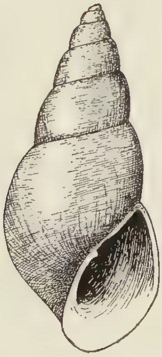
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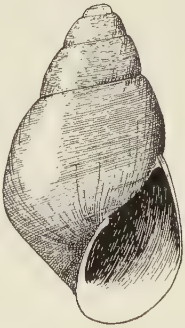
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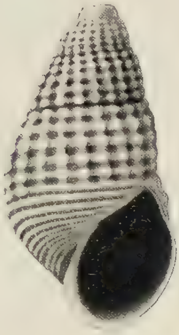
Plate 67

This plate from *Proceedings of the United States National Museum,* **52**.

FIGURE		PAGE
1.	*Odostomia santamariensis* Bartsch	Not in text
2.	*Odostomia helena* Bartsch	216
3.	*Odostomia tararali* Bartsch	Not in text
4.	*Alvania bartolomensis* Bartsch	Not in text
5.	*Alvania dinora* Bartsch	For description, see Part III
6.	*Alvania kyskaënsis* Bartsch	For description, see Part III
7.	*Odostomia valeroi* Bartsch	Not in text
8.	*Odostomia orcutti* Bartsch	227
9.	*Cerithiopsis charlottensis* Bartsch	260
10.	*Cerithiopsis bakeri* Bartsch	259
11.	*Cerithiopsis charlottensis* Bartsch	260
12.	*Cerithiopsis grippi* Bartsch	257

PLATE 67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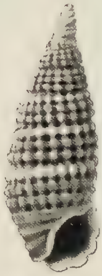
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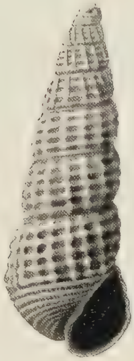
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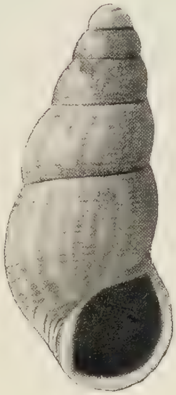
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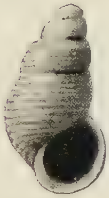
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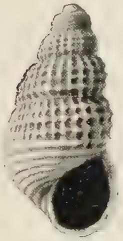
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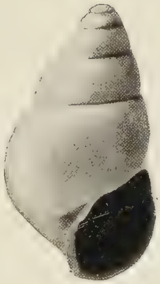
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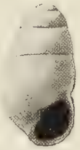
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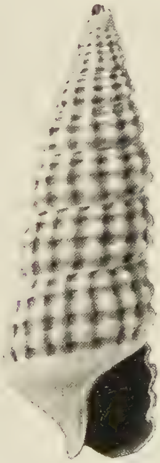
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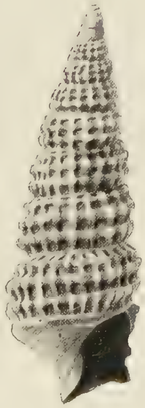
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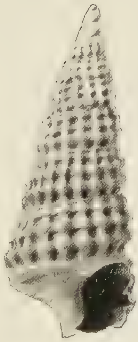
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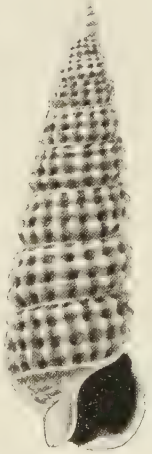
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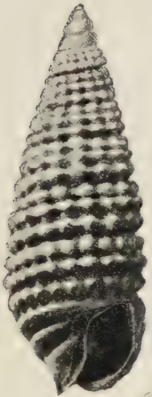
Plate 68

This plate from *Proceedings of the United States National Museum*, **40.**

FIGURE		PAGE
1.	*Cerithiopsis excelsa* Bartsch Type, fossil.	Not in text
2.	*Cerithiopsis oxys* Bartsch Type.	252
3.	*Cerithiopsis curtata* Bartsch Type.	Not in text
4.	*Cerithiopsis antemunda* Bartsch Type.	262
5.	*Cerithiopsis fatua* Bartsch Type, fossil.	Not in text
6.	*Cerithiopsis columna* Carpenter	273
7.	*Cerithiopsis gloriosa* Bartsch Type.	263

Plate 68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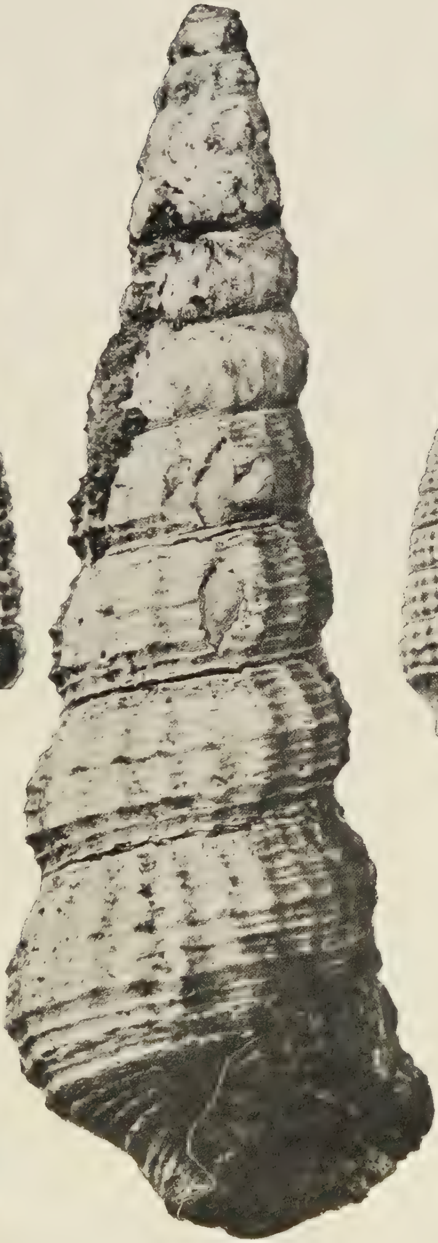
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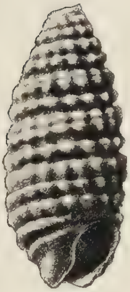
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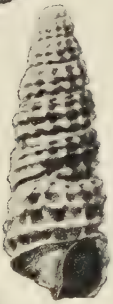
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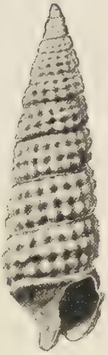
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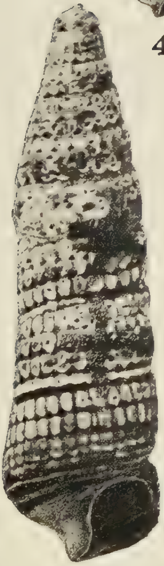
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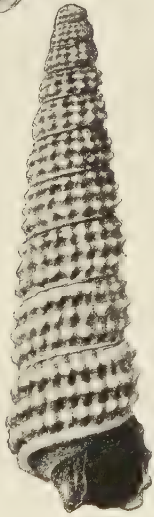
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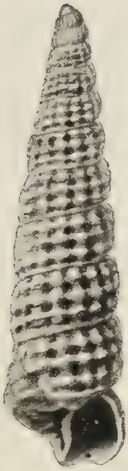
Plate 69

This plate from *Proceedings of the United States National Museum,* **40.**

FIGURE		PAGE
1.	*Cerithiopsis necropolitana* Bartsch Type.	Not in text
2.	*Cerithiopsis alcima* Bartsch Type.	267
3.	*Cerithiopsis arnoldi* Bartsch Type.	274
4.	*Cerithiopsis galapagensis* Bartsch Type.	Not in text
5.	*Cerithiopsis cesta* Bartsch	255
6.	*Cerithiopsis williamsoni* Arnold Type, fossil.	Not in text
7.	*Cerithiopsis stephensae* Bartsch Type.	275
8.	*Cerithiopsis berryi* Bartsch Type.	254

PLATE 69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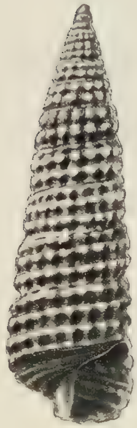
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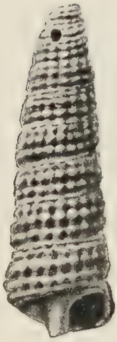
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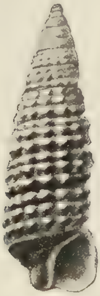
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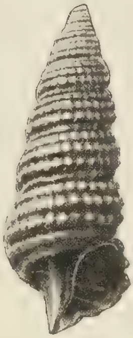
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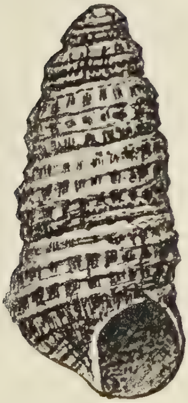
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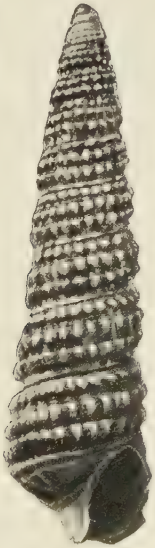
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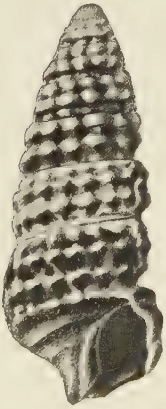
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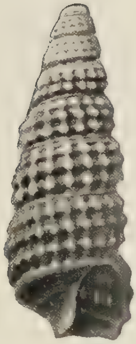
PLATE 70

This plate from *Proceedings of the United States National Museum,* **40.**

FIGURE		PAGE
1.	*Cerithiopsis aurea* Bartsch Type.	Not in text
2.	*Cerithiopsis truncata* Dall Type.	270
3.	*Cerithiopsis stejnegeri* Dall Type.	256
4.	*Cerithiopsis diegensis* Bartsch Type.	262
5.	*Cerithiopsis neglecta* Bartsch Type.	Not in text
6.	*Cerithiopsis rowelli* Bartsch Type.	264
7.	*Cerithiopsis stejnegeri dina* Bartsch Type.	257
8.	*Cerithiopsis halia* Bartsch Type.	Not in text
9.	*Cerithiopsis antefilosa* Bartsch	266

Plate 70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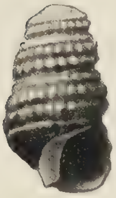
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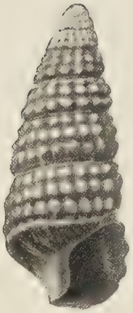
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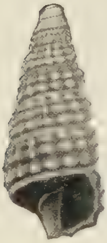
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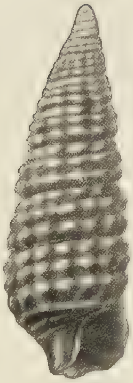
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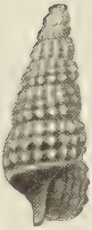
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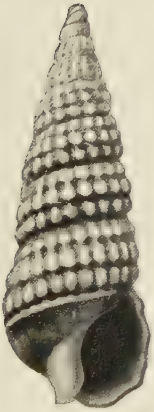
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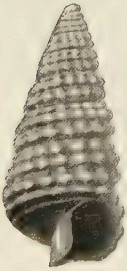
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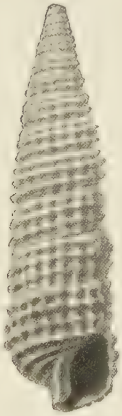
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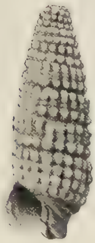
PLATE 71

This plate from *Proceedings of the United States National Museum*, **33.**

FIGURE		PAGE
1.	*Trifora pedroana* Bartsch Type.	250
2.	*Trifora peninsularis* Bartsch Type.	246
3.	*Trifora stearnsi* Bartsch Type.	248
4.	*Trifora callipyrga* Bartsch Type.	249
5.	*Trifora galapagensis postalbus* Bartsch Type.	Not in text
6.	*Trifora inconspicuus bicolor* Bartsch Type.	Not in text
7.	*Trifora galapagensis* Bartsch Type.	Not in text
8.	*Trifora excolpus* Bartsch Type.	Not in text
9.	*Trifora chathamensis* Bartsch Type.	Not in text
10.	*Trifora adamsi* Bartsch Type.	Not in text
11.	*Trifora alternatus* C. B. Adams Type.	Not in text
12.	*Trifora hemphilli* Bartsch Type.	Not in text
13.	*Trifora galapagensis unicolor* Bartsch Type.	Not in text
14.	*Trifora dalli* Bartsch Type.	Not in text
15.	*Trifora inconspicuus* C. B. Adams	Not in text
16.	*Trifora carpenteri* Bartsch Type.	249
17.	*Trifora montereyensis* Bartsch Type.	251
18.	*Trifora catalinensis* Bartsch Type.	247
19.	*Trifora panamensis* Bartsch Type.	Not in text

Plate 71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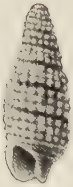
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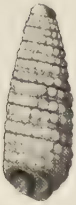
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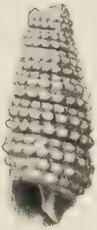
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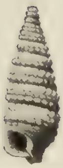
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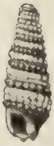
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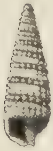
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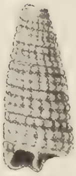
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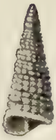
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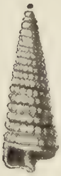
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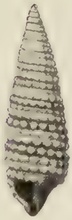
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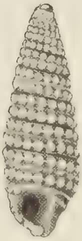
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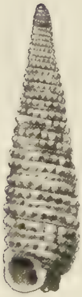
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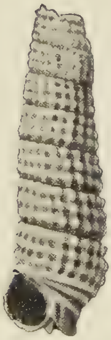
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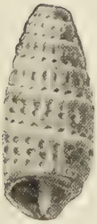
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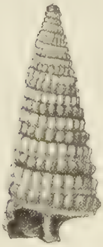
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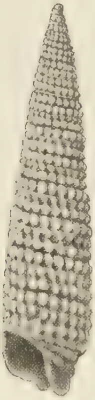
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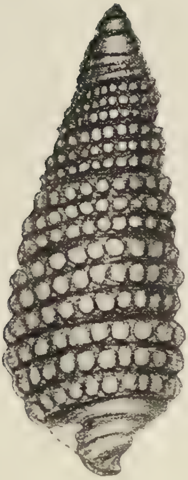
Plate 72

This plate from *Proceedings of the United States National Museum,* **40.**

FIGURE		PAGE
1.	*Cerithiopsis pupiformis* Bartsch Cotype.	Not in text
2.	*Cerithiopsis pedroana* Bartsch	254
3.	*Cerithiopsis fossilis* Bartsch Type, fossil.	Not in text
4.	*Cerithiopsis paramoea* Bartsch Type.	259
5.	*Cerithiopsis pupiformis* Carpenter	Not in text
6.	*Cerithiopsis bicolor* Bartsch Type.	Not in text
7.	*Cerithiopsis cosmia* Bartsch	265
8.	*Cerithiopsis magellanica* Bartsch Type.	Not in text
9.	*Cerithiopsis carpenteri* Bartsch	253

PLATE 72



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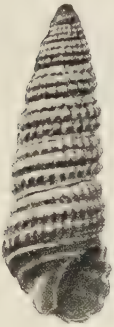

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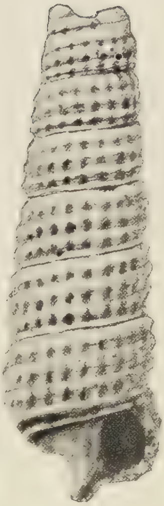

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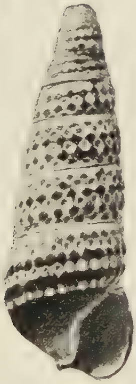

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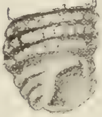

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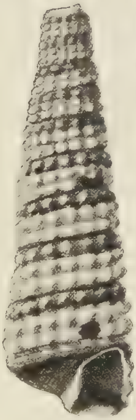

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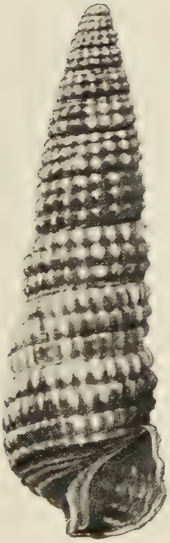

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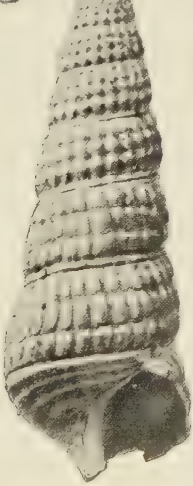

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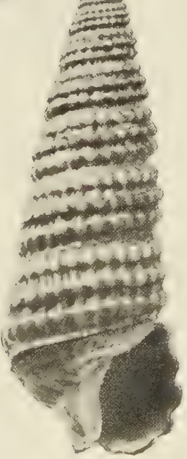

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